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HETEROCHROMIA IRIDIS WITH CYCLITIS AND CATARACT

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CHICAGO

After a discussion of the literature of heterochromia iridis both congenital and acquired, ten personal cases of heterochromia due to anterior uveitis are described. The condition known as heterochromia iridis with cyclitis and cataract is a definite clinical entity, probably due to a mild form of glandular tuberculosis, but which would be more correctly named heterochromia iridis with anterior uveitis and cataract. In these cases the decoloration of the iris is to be regarded as the sequel and not the precursor of the uveitis. Favorable results follow long continued use of tuberculin. Read before the New England Ophthalmological Society, April 16, 1929.

According to Schindler, about seventy per cent of all children are born with blue irides, while the remaining thirty per cent run through the gamut of colors from blue to dark brown. This applies of course, only to Caucasians. After some six weeks of extrauterine life, the color of the iris may begin to darken, depending upon the preponderance of pigment in the parents, a rule which adheres closely to the Mendelian law.

Usually, the two irides darken simultaneously and equally, but in some cases one seems to lag behind in attaining the darker hue. It is fair to assume that the lighter one lags behind rather than that the darker one progresses abnormally fast, for in adult life it is invariably the lighter eye, if any, that presents a pathological picture. The entire iris or only a part thereof may be affected, but, according to Wolfrum, partial heterochromia of the iris must be regarded in the same light as complete variation in the color of an entire iris. In humans, this does not occur with great frequency, but nevertheless it is more common than in animals. Horses, dogs, and cattle with one blue and one brown iris are met with, and this is usually accompanied by a lack of pigment in the fur on the side of the blue iris.

The color of an iris is based upon three factors; (1) the thickness and density of the iris stroma; (2) the number and density of the chromatophores in the iris stroma; and (3) the density of the posterior pigment epithelium. With these three variable factors through the area of 360 degrees, it can be seen that innumerable physiological variations may occur. In the blue iris, the stroma is fairly thin and the chromatophores few in number. As the stroma becomes thicker, the color of the iris gradually assumes a grayer tint, verging into green as the chromatophores increase in number. A still greater increase in chromatophores causes the iris to appear brown. The dark brown iris color is partly due to an over-thick posterior pigment layer. Thus a pathological change in any one or two of these three color factors may cause a change in the color of the iris which may be permanent or temporary, depending upon the presence of the tissue changes.

Thus heterochromia iridis may be (A) congenital, (B) a retrogressive development in postinfantile life, or (C) the result of a pathological process.*

* In Wilbrand-Saenger-Behr it is stated that "the question is still unanswered as to whether changes in the cervical sympathetics can produce a change in the color of the iris on the same side". But Weizen-

(A) Congenital heterochromia iridis has been seen with sufficient frequency to be an established anatomical fact. It is a developmental anomaly and not due to a pathological process before or immediately after birth. The occurrence of this anomaly is of interest, particularly from the eugenic standpoint, but that does not fall within the scope of this paper.

I have the records of three cases of this type. One was seen before the slit-lamp era, and, although nothing pathological was noted, still it can not be regarded as a clear-cut example. The other two have been seen and studied biomicroscopically within the past two years, and belong without doubt to the congenital heterochromic type. Innumerable cases of partial heterochromia iridis have been studied under the slit-lamp within the past eight years, but are not included in this paper because of the incomplete decoloration.

(B) Physiological depigmentation of both irides in perfectly healthy eyes has been observed by Lutz in twenty-four cases. In thirty-two further cases, unilateral depigmentation was seen. Of this latter number, eighteen were uncomplicated by any pathological process, while in thirteen of the remainder uveitis was present. In his wide experience of eighty-seven cases, Lutz has come to the conclusion that depigmentation precedes the pathological process which develops in a lighter and hence less resistant eye. But this view is not concurred in by the majority of authors.

(C) When a pathological process is present or has left traces of having been present in an eye with a lighter colored iris than its fellow, circumstantial evidence alone can prove whether the pathological process preceded the depigmentation or vice versa. As far as a careful search of the literature reveals, there is not a single positive case that has been examined under the slit-lamp in which it can be proved that an acquired lighter color of the iris preceded the presence of a pathological condition. Therefore it is only fair to assume that the depigmentation is a result and not the precursor of the inflammatory condition.

This may be illustrated by the case of a woman aged thirty-nine years who came under my care a year ago, complaining of a gradual loss of vision in one eye. The eye in question was markedly lighter than its fellow, which had a fairly dark blue iris. Examination showed many fine posterior precipitates, a somewhat atrophic iris, and a fairly uniform diffuse opacity of the lens; in other words, a very typical heterochromia iridis with cyclitis and cataract. The patient was positive that the hue of the iris had been lighter only within the past few years.

In 1916, she had been examined by Dr. W. H. Wilder, who was kind enough to supplement the record with the following report: "Both eyes externally and ophthalmoscopically normal. The left eye has a few spicules in the posterior lenticular cortex, which showed as black spots upon illuminating the fundus with a plane mirror. Vision in either eye with correction was normal".

Inasmuch as this examination preceded the slit-lamp era, it is impossible to say whether microscopic evidences of cyclitis were present at that time; but in all likelihood they were there and the quiet cyclitic process had already induced beginning lens changes.

As a rule, patients are not aware of any changes in a heterochromic eye until lens opacities have advanced sufficiently to interfere with the vision of that eye. But at times pain will lead them to consult an oculist. Such pain is not of the type that accompanies an acute iridocyclitis, but is usually the dull ache that is due to

blatt recently reported two undoubted cases of heterochromia iridis without posterior precipitates or cataract, following cervical sympathetic paralysis with Horner syndrome secondary to enlargement of the thyroid.

a mild degree of secondary hypertension. Such a case was number thirteen, in which the patient was more disturbed by the pain than by the decrease in vision.

Hypertension is not at all a rare experience in these cases of heterochromia iridis with cyclitis. It is seldom manifest in the acute uncompensated form, the so-called acute inflammatory glaucoma, although this may occur, as is shown in case number twelve. The hypertension is usually a quiet rise in pressure to a moderate degree, with corneal edema and rigid dilated pupil only after the hypertension has existed for a long time.

It does not seem likely that the hypertension is due to any swelling of the lens, for with that causative factor we are accustomed to see violent outbursts of uncompensated glaucoma. Nor can the hypertension be due entirely to blockage of the chamber angle by fibrin or albuminous coagulum, for only too often is the hypertension of heterochromia iridis accompanied by a deep anterior chamber.

In all probability, the cause of the hypertension must be sought in a contracture of the meshes of the pectinate ligament, in a decreased absorption of aqueous by the anterior surface of the iris, and in an increased output of aqueous by the ciliary body due to the inflammatory reaction. In the present state of our knowledge of the inflow and outflow of the aqueous such an explanation is pure conjecture. But certain it is that iridectomy seldom serves to keep the tension in such cases within the so-called normal limits. Of the ten pathological cases here reported, four showed hypertension at one time or another.

The presence of precipitates on the posterior surface of the cornea forms a positive indication of the existence of uveal disease in a heterochromic eye. In color, the precipitates appear to be a light gray, but are just dark enough to appear no longer translucent in transmitted light of moderate intensity such as is used in ophthalmoscopy.

According to Fuchs, they are composed exclusively of mononuclear cells, lymphocytes, thrown off from the surface of the iris and ciliary body. That author believes that they congregate there into small clumps and these are carried by the currents in the aqueous to the posterior corneal surface to which they adhere.

But it seems more probable that they are thrown off from the iris surface individually and thence are carried to the cornea where they clump. In active cases, the individual cells are seen clearly in the anterior chamber by microscopy with focal illumination, but never have the clumped cells been observed floating freely in the anterior chamber.

The round form of the posterior precipitates is undoubtedly due to surface tension. As the precipitates age and the process in the uvea becomes quiet, so that histolysins appear in the aqueous, the posterior precipitates shrink and become crenated, the margins appearing saw-toothed. Eventually the contents of the precipitates are absorbed by the aqueous and their disappearance is complete.

In this connection, a rather unusual occurrence that came to attention the other day may well be recorded. In a seventeen-year-old girl, there was a quiet anterior uveitis of several months duration, but without discoloration of the iris. The entire posterior surface of the cornea was plastered with large fat-like precipitates. Near the lower angle of the anterior chamber was an unusually large succulent precipitate. In the overlying cornea was a small leash of vessels that had advanced from the adjacent limbus into the deeper stromal layers. Opposite the precipitate, the vessels bent sharply posteriorly at a right angle and penetrated through the posterior corneal endothelium to enter the precipitate. The vessels were so fine that only a single column of blood cells was carried; but the regular inflow and outflow of the blood

could be seen with only eighty-five diameters magnification.

The anterior chamber in cyclitic heterochromia iridis with cataract is sometimes cloudy so that the beam of the slit-lamp is visible. Of the ten cases here reported, the anterior chamber was clear in six, while the slit-lamp beam was visible in four.

Cellular activity in the anterior chamber is slightly more frequent and of course depends upon the stage at which the condition is seen. In the active phase, where lymphocytes are being thrown out by the iris and ciliary body, cell presence and activity in the anterior chamber is to be expected; while in the later quiescent stages the chamber is apt to be clear.

The cells usually seen are those that adhere to the posterior surface of the cornea to form the precipitates, that is to say, lymphocytes and small mononuclears. But at times minute pigmented cells are visible in the anterior chamber. These are probably free pigment granules, resulting from breaking down of the anterior surface of the iris. They are not gelatinous and have no mucilaginous characteristics such as have the white blood cells; hence they never adhere to the posterior surface of the cornea as do the latter, but are probably carried off through the filtration angle. Consequently, pigmented precipitates are never seen. The rate of motion of the cells in the anterior chamber seems to be essentially that of a normal eye.

The iris presents an interesting picture, and I believe that cyclitic heterochromia iridis (after the precipitates have disappeared) can be differentiated from congenital or developmental heterochromia iridis by careful examination with focal illumination and suitable magnification. The pathological heterochromic iris appears compressed and has lost the normal fluffy appearance of the anterior stroma. The individual fibers do not stand out distinctly and the whole surface appears to have a close-mesh weave. In the nonpathological form, on the other hand, the anterior stroma stands out as though there was fluid between and under the iris stromal strands.

Pigment cells can be seen in both cases, but they are sparse and isolated. Furthermore, upon illuminating the pupil with the beam of light, in the cyclitic heterochromic iris the posterior pigment epithelium appears riddled with holes like a sieve, due undoubtedly to absorption; whereas this appearance is missing in the nonpathological type.

The pigmented pupillary margin of the iris in the pathological cases is usually distorted, with a more or less complete loss of the serrated border appearance. When the inflammation is active, minute gray tags of tissue may protrude into the pupillary area from the pigmented pupillary border. These tags are very short and fairly slender. Their distal end is free, and they never form adhesions between the iris and the lens. Eventually they disappear entirely. As to their nature, no histological examination of them has ever been recorded. Such tissue tags were quite prominent in case number eight.

As the disease progresses, the iris changes color somewhat more, due to the ingress of new vessels that wander at will through the stroma immediately under the surface. These vessels never progress radially, and appear most frequently in connection with hypertension. Simultaneously the pupil dilates to four or five millimeters and becomes rigid.

Posterior adhesions are never formed. In a few cases, minute gray nodules have appeared lying deep in the iris stroma, usually near to the pupillary border. Undoubtedly these represent some stage of tubercle formation and are of a more or less transient nature.

Practically nothing is known regarding the behavior of the ciliary body in this condition. Undoubtedly it participates in the pathological process, but to what extent is unknown.

As a rule the lens opacity is present to a sufficient extent to interfere with the measurement of accommodation by which ciliary body involvement could be estimated.

In case six of this series, the lens was perfectly clear. This was in a young person of twenty-three years with a typical quiet cyclitis in a blue right eye whose fellow eye was brown. There were many fine precipitates on the posterior surface of the cornea and some cell activity in the anterior chamber, which was perfectly clear. The iris was light blue and presented a close-weave appearance. The pupil reacted normally and the lens was entirely clear.

Under homatropin, the refraction of each eye was as follows:

R. + 1.00 sph. + 1.75 cyl. ax. 105° = 0.6.

L. + 1.75 sph. + 1.25 cyl. ax. 75° = 0.5.

The decreased vision in the normal left or in the heterochromic right eye could not be explained by the subjective or objective findings, except from disuse, as he had never worn glasses. The range of accommodation in each eye was equal and normal.

In two of the cases of congenital heterochromia iridis of this series, the accommodation was the same in the lighter as in the darker eye. Consequently, there is no basis for believing that the ciliary musculature is involved in the early stages of the process or before the iris musculature is involved.

The lens changes usually appear early and most frequently are the cause of the patient seeking relief on account of decreased vision. All authors agree that the opacities are seen first in the posterior subcapsular cortex and show as minute irregular linear gray spicules. These gradually increase in size and density and eventually form a well defined, more or less disc-like opacity between the nucleus and the posterior pole. Then peripheral spoke-like opacities appear which are followed in short order by a generalized diffuse opacity of the entire lens. When completely opaque, the lens cannot be differentiated clinically from a mature senile cataract.

The early opacities resemble those described by Wagenmann in his classical experiment in which he cut the posterior ciliary arteries in rabbits. After a long period of time, the animals all developed anterior and posterior subcapsular lenticular opacities. The thought occurs that the lens opacities which develop in heterochromia iridis with cyclitis may be associated with degenerative processes of the vascular system within the ciliary body, and the subsequent intrusion of toxins into the aqueous that bathes and nourishes the lens.

Although the posterior precipitates may disappear with all evidences of inflammation, still the lens opacities progress slowly to complete maturity. This is shown by the case of a man of forty-two years first seen in 1925 (case eight), with the definite history of decreased vision in the left eye for three years. His mother stated positively that in childhood the eyes had been alike in color. He presented a typical heterochromia iridis with cyclitis and cataract, the latter being so slight that the vision was still 0.8.

Physical examination ruled out all possible etiological factors except tuberculosis, and the patient was given two complete courses of tuberculin injections. By November, 1928, practically all traces of the cyclitis had disappeared, although the typical heterochromia iridis persisted. Slight hypertension developed, but this was easily controlled with pilocarpin. Nevertheless, the lens opacity had progressed until the vision was reduced to finger counting. All authors, including Collins and Mayou, agree that these eyes present no undue difficulties or complications upon extraction of the cataractous lens.

Fundus complications have been reported in many cases, ranging all the way from slight vitreous opacities to most extensive inflammations of the retina and choroid. On the other hand, in the majority of cases reported, no mention is made of com-

plicating disease of the fundus. Lesions of the retina and choroid with vitreous opacities might well be expected in cyclitic heterochromia iridis, for the same factors that underlie the anterior uveal disease can be responsible for disease in the posterior segment. Nevertheless, retinitis and choroiditis are not constant findings in this condition.

Histologically, but very little attention has been paid to heterochromia iridis with cyclitis and cataract. In 1906, Fuchs reported the examination of iris tissue in this condition obtained by iridectomy. In 1917, he modified his statements of the first article, particularly in regard to the density of the nuclei in the anterior stroma of the iris. The error arose from the fact that his earlier specimens had been hardened and consequently shrunken in alcohol. Nevertheless there is a definite increase in the size and density of the nuclei in the anterior iris stroma and a marked increase in the fibrillated connective tissue.

No polymorphonuclear leucocytes were found, and only comparatively few lymphocytes and mast cells. Around the vessels was a good deal of hyalin and in the stroma were many small hyalin-like Russell bodies. The iris pigment was free in the tissue and the pigment epithelium layer showed but few changes. Within the ciliary body, the only abnormality found was the presence of a small number of lymphocytes. The histological picture corroborated the clinical picture of absolute lack of plastic inflammation. The few other histological studies made corroborate Fuchs's findings.

Among the authors who have investigated the etiology of heterochromia iridis with cyclitis and cataract, there is considerable unanimity of opinion that tuberculosis is the underlying factor. True it is that the presence of a tuberculous area or nodule from which the toxins can originate can not be located clinically in all cases; still the x-ray findings of the chest, the strongly positive Pirquet reaction, the absence of other possible etiological factors (or the continued progress of the uveitis when the other factors, if present, are removed), and the universally beneficial reaction to long continued use of tuberculin all combine to render the diagnosis of tuberculosis almost a certainty. This has all been discussed very recently and at length by King in an article that contains a most extensive bibliography and does not need repetition here.

Undoubtedly comment will be made upon the fact that Koch's old tuberculin was not used for diagnosis. I have abandoned the use of that for several years on account of the unreliability of the results, in which Finnoff agrees with me. Here, as in various other ocular conditions, the diagnosis of a tuberculous etiology must be made by exclusion of all other factors possible. That, combined with clinical experience, is the most positive diagnosis of the etiology that we are today justified in making.

The treatment of heterochromia iridis combined with cyclitis and cataract must be aimed at the causative factor. Although it is fairly universally recognized that tuberculosis is that factor, still a thorough physical examination, serological investigation, analyses of blood and secreta, and radiological study must be made. Incidental factors other than tuberculosis should be handled as needed, and then—tuberculin should be started.

I prefer the standard bacillary emulsion, because I am familiar with its use; doubtless other equally proved products, such as tebeprotein, will attain the same results. A minimum dosage must be used in the beginning, preferably 1/100,000 milligram, and the amount increased slowly and constantly. Injections once a week are sufficient, and the total period of one course will be from four to six months in length.

In some cases, that will suffice to remove all evidences of the cyclitis.

But in other cases, especially where there is a mild degree of hypertension, the course will have to be repeated two or even three times with two or three months interval between courses.

Whether the tuberculin acts as a specific or whether it acts merely as a mild foreign protein is not known, and moreover the discussion thereof does not lie within the scope of this paper. The general hygienic régime so necessary in systemic tuberculosis and so advisable in other forms of ocular tuberculosis does not seem to be the essential here that it is in other conditions.

Locally, the treatment of the condition is purely symptomatic. The cyclitis is usually so mild that practically nothing except discomfort for the patient is gained by the long-continued use of a mydriatic. Heat seems equally without avail. When hypertension intervenes, in the early stages a weak solution of pilocarpin once or twice daily will serve to keep the tension within normal limits. Under these conditions, there does not seem to be any tendency for the hypertonic process to advance beyond control.

In the later stages of hypertonicity, miotics seem to be entirely without effect, but the pain of hypertension is most usually absent, although acute attacks of painful uncompensated hypertension may occur. Such was the experience in case 12. When this does occur, iridectomy is indicated. This procedure will relieve the pain and the lack of compensation, but will not keep the tension within the so-called normal limits.

When the lens is completely opaque, it may be extracted without fear of unusual complications, provided the cyclitis has disappeared. If the retina and choroid are not involved, the vision of the resultant aphakic eye will be as nearly normal as the surgical procedure admits. But operation must not be undertaken until every last vestige of the cyclitis has disappeared and has been gone for months. Then, if the lens opacity is mature, it may be extracted. Whether or not unilateral extraction is indicated when the fellow eye has full useful vision is debatable. The resultant diplopia may be frightfully annoying; on the other hand, the gain in the field of vision may be equally compensating.

I have not been able to find in the literature a single case in which a typical heterochromia iridis with cyclitis and cataract existed and the second eye became similarly involved at some later period. But it is possible to conceive of such an occurrence.

But one major point remains for discussion. Why should a mild iridocyclitis of the type here described, most probably due to tuberculosis, result in depigmentation of the iris, formation of cataract, and absence of adhesions, while another iridocyclitis, not infrequently of the same etiology, will cause adhesions and manifest evidences of active inflammation, but no cataract and no depigmentation of the iris, even though the disease may exist for a long time. That question can not be answered in the present state of our knowledge, no matter how attractive it is to theorize about it.

Following is a brief résumé of the cases that actuated this paper. Some of them have been used in the body of the paper to illustrate one point or another, but are repeated here. The number of cases is altogether too small to justify any statistical conclusions.

Case reports

Case 1. E. M., aged eighteen years, female. 1916. The right iris was a light blue and the left iris was light gray to brown. Both lenses were normal and there were no evidences of precipitates. The error of refraction was low and the vision was normal.

Case 2. A. T., aged twenty-eight years, male. 1928. The right iris is markedly lighter brown than the left. Both corneas normal; no posterior precipitates; both lenses normal. Low

error of refraction. Corrected vision normal.

Case 3. R. W., aged fifty years, male. 1928. The right iris is of a hazel color and contains nine small brown pigment spots. The left iris is of a brown color, the same as the pigment spots in the right iris. No posterior precipitates are present and both lenses are normal. Low myopic astigmatism and corrected vision normal.

Case 4. L. M., aged fifty years, female. March 12, 1928. Left vision poor for five years. Right eye normal; iris greenish blue color. Left eye pale but flushes easily. On posterior corneal surface are many fine discrete precipitates. Anterior chamber clear and contains no cells. Iris light blue in color and somewhat atrophic. Marked patchy atrophy of posterior pigment epithelium, seen on transillumination. In the upper inner quadrant of the pupillary border, the pigment is missing. A few new vessels are on the iris. No posterior adhesions or pigment on lens capsule. Lens diffusely opaque. Tension normal. Thorough physical examination revealed a few bad teeth that were removed, but no other pathology. Pirquet positive. Tuberculin was started and on November 15 the eye was pale and no longer flushed. A few posterior precipitates were still present, but they were all crenated. No change in iris or lens.

Case 5. B. N., aged thirty-two years, female. April 29, 1927. Right vision has always been worse than left and right eye has diverged recently. Left eye essentially normal except for a low error of refraction. Right eye pale. A great many small fresh fine precipitates on posterior corneal surface. Beam of slit-lamp visible in anterior chamber, which contains some pigment cells, but seemingly no blood cells. The right iris is a much lighter blue than the left iris. The right iris is somewhat atrophic and shows marked patchy atrophy of the posterior pigment epithelium. No posterior adhesions. The lens is diffusely opaque. Tension normal. Physical examination showed a few bad teeth, which were removed, a positive Pirquet, a negative spinal fluid with the Wassermann reaction, and many large fibroids. The uterus was removed and tuberculin started. The first course was completed by the end of December, 1927, and the second started June, 1928. In November, 1928, the right eye was pale and did not flush on manipulation. The posterior precipitates were less in number and nearly all were crenated. The slit-lamp beam was still faintly visible in the anterior chamber, which contained a few white blood cells in active motion. The iris showed but few changes except for the formation of several minute gelatinous nodules at the inner pupillary border. Tension was normal and the lens was uniformly opaque.

Case 6. I. S., aged twenty-three years, male. July 12, 1928. Left vision always poor. The right iris was definitely blue and the left iris brown. In the right eye, there were multiple fine fresh and some old precipitates on the posterior corneal surface. The beam was not visible in the anterior chamber, but there were a few cells in active motion. The iris was slightly flatter than its fellow, but otherwise essentially normal. The lens was clear. The left eye was normal. It is interesting to note that the range of accommodation in each eye was equal and normal, despite the fact that the corrected vision was below normal. Physical examination was negative except for a low-grade mitral endocarditis, well compensated. No evidences of tuberculosis by physical examination or in x-ray of the chest. Tuberculin was started nevertheless.

Case 7. M. G., aged forty-nine years, male. May 9, 1928. Right vision hazy past three years, and halo vision continuous past three months. Left eye essentially normal. Vision and tension normal. Right iris definitely lighter in color than left. Eye faintly injected. Cornea edematous. On the posterior surface are a dozen definite small posterior precipitates.

The anterior chamber is very cloudy, but no cells can be seen. The iris is very atrophic and contains many new radial and circular vessels. The pupil is 4 mm. and rigid. Lens opacity present but details not visible. Tension 75 mm. Hg. Physical and serological examination revealed no abnormalities beyond a very mild prostatic enlargement and definite low-grade ethmoiditis. The ethmoids were then exenterated. The tension was reduced to normal by the local use of adrenalin and held there with pilocarpin. The corneal edema disappeared promptly. On November 20, the presence of a half-dozen small gray mucilaginous nodules at the pupillary border of the iris was noted. The condition was otherwise unchanged and tuberculin was started.

Case 8. G. P., aged forty-two years, male. December 31, 1925. Left vision began to decrease eight months ago. Right eye essentially normal. Left eye pale. Large number of fine posterior precipitates on posterior surface of cornea. Slit-lamp beam faintly visible in anterior chamber, which contains no cells. The iris is definitely lighter than its fellow, but shows no marked pathology. There is a large nearly circular opacity of the lens underneath the posterior surface. Fundus normal. Tension normal. Corrected vision equals 0.8. Physical examination revealed no pathology except seven infected teeth which were removed. Tuberculin was started. In June, 1926, a few gray nodules near the pupillary border of the iris were noted. In October, 1926, the precipitates had disappeared, and the course of tuberculin was finished in December, 1926. In August, 1927, the precipitates had reappeared, although fewer in number and very small in size. The slit-lamp beam was visible in the anterior chamber, which now contained some cells in active motion. Tuberculin was again started and the course concluded in January, 1928, when nearly all of the precipitates had disappeared. The vision then was 0.5. In June, 1928, the precipitates were still present, but no new ones had appeared. The anterior chamber was clear. Vision had sunk to 4/200 on account of an increase in the lens opacity. The third course of tuberculin was started. In September, 1928, a tension of plus one was noted, but this became and remained normal upon the use of 0.5 per cent pilocarpin once daily. By November, 1928, the precipitates had nearly disappeared.

Case 9, G. C., aged forty-two years, female. May 8, 1928. Complains of spots before the left eye past four years. Right eye essentially normal. Iris blue. Left eye pale. On the posterior surface of the cornea are twelve fine round precipitates. The anterior chamber is clear and contains no cells. The iris is very distinctly lighter in color than its fellow and presents no pathology. The pupil is normal. Under the posterior capsule of the lens are several discrete large diffuse opacities. The vitreous contains a few formed floaters. The fundus is normal. Corrected vision equals 0.5. Physical and serological examinations were negative except for a moderate splanchnoptosis and a positive Pirquet. X-rays of the chest were negative. Tuberculin was advised.

Case 10. M. C., aged thirty-three years, male. October 7, 1927. Struck in the right eye with a fist five years ago. Right vision was good one year ago, when glasses were fitted, but has failed in the past three months. Right eye pale. There are a few small precipitates on the posterior surface of the cornea. The anterior chamber is clear. The iris is normal but is definitely lighter in color than the left. No posterior adhesions. There is a complete diffuse opacity of the lens. Vision and tension normal. Physical examination negative. Tuberculin was advised, but refused.

Case 11. M. R., aged thirty-nine years, female. March, 1928. Left vision blurred off and on for nearly ten years. Right eye essentially normal. Iris bluish green in color. The left eye was pale. There were many fine precipitates partially crenated on the

posterior surface of the cornea. The anterior chamber was clear and only an occasional cell could be seen. The iris was slightly atrophic and some of the pigment of the pupillary border was missing. It was definitely lighter in color than its fellow. The pupillary reaction was sluggish, but present. Tension was normal. The lens was completely opaque. Dr. W. H. Wilder examined this patient in 1916 and kindly informed me that his records showed no evidences of precipitates or heterochromia iridis at that time, but that there were a few spicules in the posterior lenticular cortex. Physical examination was negative except for a few perineal tears which were repaired. Tuberculin was started, and by November, 1928, the posterior precipitates had disappeared entirely and the pupillary reaction had reassumed its normal character.

Case 12. H. A., aged thirty years, female. First seen in 1899 by my father, Dr. H. Gradle, for a simple conjunctivitis. Both fundi and vision were then normal. In 1911, a glaucoma simplex was diagnosed by another oculist, and the patient was kept under eserin, despite the fact that she was only twenty-two years old. In 1919, the right eye was normal. The left eye showed a slight ciliary injection. There were many fine precipitates on the posterior surface of the cornea. The anterior chamber was deep and clear. The iris was very atrophic, much lighter in color than its fellow, and covered with a network of fine vessels. The pupil was under eserin. The lens showed a diffuse opacity, particularly in the posterior cortex. Upon stopping eserin, the pupil dilated to 4.5 mm. and became rigid. Tension went to plus two. The disc was completely excavated and the eye was amaurotic. Old tuberculin gave a marked local but no general reaction. General physical examination was negative. In August, 1920, there was a sudden and painful rise in tension that necessitated an iridectomy. Following this, gradual degenerative changes in the cornea appeared so that now the cornea shows irregular diffuse plaques in the stroma. There are no posterior precipitates and the anterior chamber is clear. The iris is very atrophic and has many fine new vessels. A small coloboma is upward. The lens is completely opaque. The tension varies between plus one and plus two, but entirely without pain or symptoms. The eye is of course amaurotic.

Case 13. M. C., aged thirty-two years, female. June, 1928. Acute ethmoiditis last February. Right vision blurred the past three weeks. Right eye has a faint ciliary injection. There are a large number of small precipitates on the posterior surface of the cornea. The slit-lamp beam is visible in the anterior chamber and considerable fibrin and cells can be distinguished. The pupillary border of the iris is markedly thickened and browner than the periphery. The entire iris is much lighter in color than its fellow. In the periphery, the iris is definitely atrophic and shows some new vessels. Scattered around the pupillary margin and seemingly protruding from the posterior pigment epithelium are a dozen small gray nodules that protrude into the pupillary area. A few opacities in the lens cortex are visible. The fundus cannot be seen. Tension equals 61 mm. Hg. The left eye is normal. The x-ray showed slight cloudiness of the ethmoids, but no pathology could be seen on inspection. Physical examination was negative except for slight apical dullness. X-ray of the chest negative despite positive Pirquet and slight p.m. temperature. Adrenalin was used locally and brought the tension down to normal, where it remained despite the long continued use of atropin. Tuberculin was started, and by November, 1928, the eye was pale and the posterior precipitates were less in number and nearly all crenated. The anterior chamber was nearly clear and the pupil well dilated. The swelling of the pupillary border of the iris had disappeared, as had the nodules at the edge of the iris. The fun-

dus was normal. This was not a perfectly clear-cut case and really should be classed as a borderline case.

Conclusions

(1) Heterochromia iridis may be (A) congenital, (B) acquired in extrauterine life without preceding pathological process, or (C) the result of an anterior uveitis.

(2) It is possible that there may be a fourth form of heterochromia iridis due to disturbance of the cervical sympathetics, but absolute proof thereof is not yet forthcoming.

(3) The condition known as heterochromia iridis with cyclitis and cataract is a definite clinical entity, due in all likelihood to a mild form of glandular tuberculosis.

(4) The name of that clinical entity is incorrect, for, as far as can be determined, the ciliary body participates but little if any in the process, and consequently this should be known as heterochromia iridis with anterior uveitis and cataract.

(5) Judged by the cases reported here and in the preceding literature, it would seem that the decoloration of the iris in the clinical entity above described is the sequel and not the precursor of the uveitis.

(6) Favorable results follow long continued use of tuberculin.

58 East Washington street.

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INFANTILE AMAUROTIC FAMILY IDIOCY IN TWO JAPANESE FAMILIES

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The literature with regard to the infantile and juvenile types of amaurotic family idiocy is reviewed. Two new cases here recorded were encountered in Japanese girl children, and there was great probability that a sister of the first of these patients had had the same condition. In each case the parents were first cousins. Out of fourteen cases of the juvenile type, including the two here added, the disease has occurred in the male sex only twice. From the department of ophthalmology, University of California medical school.

Amaurotic family idiocy was first described by Tay[1] in 1881. The patient was a twelve-months-old child brought because of gradually increasing muscular weakness. Upon examination of the fundi, Tay found the macular changes now associated with the disease. At a later date he reported two additional cases. All three were in males of Jewish parentage. Knapp[2] in 1885 reported the first American case.

In 1887 Sachs[3] presented his account of the disease and designated it as amaurotic family idiocy. He described the entire symptom complex of which the eye findings were merely a part. In a later publication he pointed out the familial tendency of the disease and stated that the disease occurred only among Jews.

It was Higier[4] who first observed that the observations of Tay and the investigations of Sachs dealt with the same condition, and who called it Tay-Sachs disease.

In addition to the infantile type, we now know that there is a distinct juvenile amaurotic family idiocy in which similar pathological changes arise at about six or seven years of age.

With this type we are not concerned in this paper.

In the infantile type, the children are normal at birth. The first symptoms appear at about three or four months of age, when there is a weakness of the muscles of the neck and back and the child begins to lose its vision. The macular region now shows a white area of about two disc diameters with a dark red spot in its center. This is followed by complete optic nerve atrophy. In a short time the child in unable to sit up because of the muscular weakness. Muscular atrophy, rigidity of the extremities, and retraction of the head soon develop. There is also an exaggeration of the deep reflexes, and at times convulsions occur. The patient shows increasing emaciation and rarely lives beyond two years of age.

The pathology of the disease has been thoroughly investigated by a number of workers. The essential primary changes are in the ganglion cells throughout the body, not only in the retina and the central nervous system, but also in the sympathetic system.

Of the juvenile type, occurrence in non-Jewish children is relatively common. Frets and Overbusch[5] report three cases of the early juvenile type in non-Jewish children. Hay and Naish's[6] patients were three brothers whose parents were non-Jewish and unrelated, while Greenfield and Holmes[7] report juvenile amaurotic idiocy in a patient of pure English stock. In addition to the above, there are numerous other reports.

Of the infantile type of amaurotic family idiocy, occurrence in non-Hebrews is relatively rare. A recent account of the disease gives the impression that infantile amaurotic idiocy is limited to the Jewish race. But in 1901 Falkenheim[8] gathered from a review of the literature four cases occurring in Gentiles. A review of the literature by Dr. Martin Cohen disclosed only three instances of the disease in non-Jewish patients from 1901 to 1923 (Cockayne and Attlee, Tarr, Van Starck).

In 1914 Cockayne and Attlee[9] reported the condition in a one-year-old male child of English parents who were first cousins.

Tarr's[10] patient (1916) was a female child of fourteen months, a Syrian baby whose parents came from the city of Aleppo. When this case was brought to Sachs's attention, he replied "that, while the cases were supposed to be typical and of non-Jewish origin, he believed they were all found in children of the Semitic people (descendants of Shem, including Arabs, Syrians, etc.)".

In 1920 Van Starck[11] reported as to a thirteen-month-old female German child born of non-Jewish parents who were distantly related. There were five children born in this marriage, three girls and two boys. All three of the girls (the case reported being the third) developed amaurotic idiocy with fatal termination. The symptoms made their first appearance at about nine months.

In 1923, Martin Cohen[12] reported the disease in an Italian female child of fourteen months. Both parents were born in Sicily. The grandparents were first cousins.

In 1923 Levy[13] showed a nineteen-months-old child with the disease, born of English first cousins. No mention was made of the sex of the child. Hoppe and Clay's[14] patient (1924) was a femile child of Irish-English descent. Lebbetter's[15] patient (1925) was a male infant of nonrelated parents of English, Scotch, and more distant Irish extraction.

In the case of infantile type shown by Finnoff[16] in 1925, the patient, a female, was born of American parents, and as far as could be determined there was no Jewish blood in the family. Zannoni's[17] case (1925) was in a two-year-old child prematurely born after an injury to the mother. The sex was not given. In 1926 Duran[18] reported a case of amaurotic family idiocy in a Spanish girl of twenty-two months.

While amaurotic family idiocy of the infantile type is chiefly found in Hebrews, it is not necessarily limited to this race. From the above reports we see that it has also been found in non-semitic races, although only in rare instances.

In reviewing the literature, we have not found reports of the disease in the Japanese race. For this reason the following two cases of amaurotic family idiocy in Japanese children may perhaps be regarded as of unusual interest.

The first case was referred by Dr. K. Kiyasu and we are indebted to him for the history and physical findings. The second case was in the service of Dr. William Palmer Lucas at the University hospital. He kindly provided us with the case history of the patient.

In both instances it was found necessary to examine the fundi under general anesthesia.

Case 1: Shuzaka, D., Japanese aged three years, female, was referred by Dr. Kiyasu for an eye examination.

Family history: Parents are first cousins. One sister, the first born, died aged three years, the fatal malady being diagnosed as pneumonia. This child was well until ten months of age, when her vision became impaired and mental deterioration set in. She had difficulty in walking and using her arms before she died. Aside from the above, the family history was negative.

Past history: Patient was full term, normal delivery. Sat up at eight months; walked at fifteen months; said a few words at eighteen months.

Present illness: Was well until twelve months of age, when parents observed that the eyes were abnormal. This was followed by notable impairment of vision, until at present the child is able to distinguish light and darkness only. In the last six months, child seems to be dull and doesn't take the usual interest in things. Also seems to have difficulty in holding up its head and some trouble in walking.

Physical examination: Overweight child of three years, mentally below par, walks with difficulty and has some trouble in supporting head.

Deep reflexes not obtainable. Aside from the above, the physical examination is negative.

Laboratory findings: Blood, including blood Wassermann; urine; tuberculin, are all negative. X-ray skull plates negative.

Eye examination: Lateral nystagmus. Fundi under anesthesia (with pupils dilated): R. E. optic disc atrophic. In the macular region there is a grayish-white area of about one disc diameter, in the center of which is a dark red spot. L.E. as above. Fundi also seen by Dr. W. S. Franklin.

Diagnosis, amaurotic family idiocy.

Case 2: Moriye, K., Japanese female aged twenty-one months. Fundus examination requested by Dr. W. P. Lucas.

Family history: Father and mother are first cousins. First child normal to six months of age and then died suddenly; second child also died suddenly at six months of age, cause unknown. Third child died at two years of age of convulsions. Patient is fourth child.

Past history, negative.

Present illness: Baby appeared normal at birth, but her development was slow. Has been able to move legs but has never stood nor walked. At eighteen months was able to sit up and use hands to feed herself. Eight days before entry, was no longer able to sit up or use hands, also had difficulty with vision.

Physical examination: Positive findings consisted of the following: Profuse sweating, especially of head. Markedly asymmetrical head. Tongue coated, breath foul. Soft palate and pillars heavy and edematous. No movements of deglutition present. Chest shows marked Harrison's groove and slight beading of the costochondral junction. Both upper and lower extremities are extremely flaccid, with very little power. Voluntary motion of both arms and legs limited. Dey's tendon reflexes not obtained.

Eye examination: Pupils equal and regular, reacting very slowly to light. Fundi (with pupils dilated and under general anesthesia): Right eye, disc pale, indicative of partial optic atrophy. There is a grayish area of about one disc diameter in the macular region. This is not sharply demarcated from the surrounding area. In the center of this area there is a dark cherry-red spot. Left eye as above.

Laboratory findings: Urine, blood, Wassermann, and tuberculin negative. It was necessary to feed child by gavage.

Diagnosis: amaurotic family idiocy. The child was taken from the hospital by the parents against the advice of Dr. Lucas.

In both of the above cases, it was very difficult to obtain a detailed history because of the low mentality of the parents and their inability to speak English.

Comments: In the first case, the condition is not typical of the textbook account of amaurotic family idiocy. The symptoms did not develop at the usual age, and the eye symptoms antedated the other changes considerably. The fundus, however, was typical of amaurotic family idiocy, and as far as we know this fundus picture is not duplicated in any other condition.

The second case is a typical one in every respect.

In reviewing these cases, one is impressed by the frequency of consanguinity in this disease. In Cockayne and Attlee's patient, and in Levy's patient, the parents were first cousins. In the case reported by Cohen, the grandparents were first cousins. In Van Starck's patient, the parents were distantly related. In each of our cases, the parents were first cousins.

As regards sex, in Jewish children the incidence is about equally divided with perhaps a slight numerical advantage to the male.

Among the non-Jewish cases reported, the predominance of the disease in the female sex is rather marked. Of the fourteen cases noted above, the disease was found in the male sex only twice; in two reports

no mention was made of sex; and in the remainder, the children were females. Van Starck's family consisted of five children, three of whom were girls, and these three all developed the disease while the males were not affected. In our first case history, it is probable that the sister also had the same condition.

348 Post street.

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OCULOVISCERAL REFLEXES

An oculogastric reflex experimentally demonstrated

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Using a stomach balloon connected with a water manometer, tracings were made to demonstrate the effect on gastric motility of astigmatic errors and muscular imbalances artificially produced by the wearing of cylinders and prisms, respectively. Errors of refraction or of muscle balance were definitely shown to exert a repressive effect on the motor function of the stomach, while upon removal of such asthenopic irritants there was a release from inhibition. The irritative reflex occurs by way of the trigeminal and splanchnic nerves. These experiments, confirming clinical experience, emphasize the necessity for closer cooperation between gastrologists and ophthalmologists as to the control of functional gastric disorders. From the Hull physiological laboratory, University of Chicago. Read before the Chicago Ophthalmological Society, December 17, 1928.

The gastrointestinal tract and the cardiovascular system, though endowed with inherent automatism, are extremely sensitive to various nervous influences. Their functional activity is governed by a balance of antagonistic tonic and inhibitory impulses regulated by the autonomic and sympathetic nerves. These two branches of our vegetative nervous system are everywhere opposed. The autonomic contracts the pupil, dilates the arteries, slows the heart, and accelerates gastric rhythm; the sympathetic dilates the pupil, contracts the arteries, accelerates the heart and inhibits gastric motor activity. Oddly enough the same system affects dissimilarly different organs: the sympathetic that accelerates cardiac rhythm inhibits gastric motility; the vagus which is the motor nerve of the stomach is the inhibitory nerve of the heart.

A number of clinical and experimental phenomena show that the autonomic and sympathetic systems affect the eye. In hyperthyroidism there is a sensitization of the sympathetic with association of well known eye signs. On the other hand, febrile toxemias, notably tuberculosis, produce vagotonia with resulting deep-set eyes, contracted pupils, and an asthenopia that is for the most part due to this condition. Eppinger and Hess hold that even in health different individuals tend to show a slight ascendency of either one system or the other.

Conversely, impulses originating from the eye may be transmitted to the vegetative nervous system and so affect the visceral organs. Thus in acute glaucoma I have known vomiting and gastric distress to precede the onset of the characteristic trigeminal nerve pain and ocular congestion.

In the oculocardiac reflex, as first described by Aschner[1] in 1908, pressure on one or both eyeballs regularly produces a slowing of the pulse rate. The impulse travels from the trigeminal nerve to the medulla and down the vagus. In normal persons, after two or three seconds, the cardiac rate is slowed five to ten beats per minute. When the pressure is removed the former rate returns. This reflex is diminished or lost in tabes. In toxic states and in gastrointestinal neuroses, the oculocardiac reflex is particularly marked. In a case of the latter group recorded by Loeper and Maugeot[2] the pulse was slowed twenty-six beats.

No harm results from the ocular compression. In the course of my personal experiments I have had an associate compress both my eyeballs for ten minutes at a time, during which period a moderate degree of discomfort was felt. On release from pressure, the sensation of phosphene persisted for a minute or two, followed by a rapid return to normal vision.

It is generally recognized that the discomfort resulting from errors of refraction and ocular muscle imbalance

is due to irritation of the trigeminal nerves supplying the eyeball. In a sensitive individual, the irritability is diffused; the affected person receives sensations apparently coming from the meningeal branch of the fifth nerve, and complains not only of eyeache, but of headache as well. As the connections of the trigeminal nucleus are particularly extensive, it is easy to comprehend how irritability communicated to the nucleus diffuses at times likewise to the vegetative nervous system.

Whatever influences the autonomic and sympathetic nerves affects to some degree the heart and the stomach. The sensations from perverted gastric action are especially disturbing, so that even in cardiac disease gastric symptoms may dominate the picture. Functional disorders of the stomach are not stressed now so much as formerly, as the modern internist with increasing acumen seeks for the determining factor, whatever it may be—tuberculosis, diabetes, hyperthyroidism, nephritis, anemia, focal infection—and properly relegates the gastric condition to the background.

That reflex irritation from the eyes may be a factor, and a very important factor, in the maintenance of functional gastric disorders, was emphasized by ophthalmologists and gastrologists two decades ago, and numerous case reports have been cited then and since. The clinical situation has been well summarized by Charles G. Stockton in his contribution to Osler's "Modern medicine"[3]. He says:

"Most frequently the causes of gastric asthenia are to be found in eyestrain. This subject has been so widely discussed in America, and from so many points of view, that it is somewhat threadbare; yet its signal importance remains largely disregarded.

"Irregular or asymmetrical astigmatism is the usual defect most often responsible for the functional disturbance, but it is not always in astigmatism of high degree that the trouble arises. It is most commonly found in instances of moderate degree of astigmatism with axes differing in the two eyes, and especially in anisometropia. Although not limited to that period of life, the nervous disturbances following these visual defects are apt to appear after the age of puberty, and are especially active when the crystalline lens begins from age to lose its pliability."

The gastric disorder of asthenopic origin may manifest itself in disturbance of secretion, motion, or sensation, with any of the following discomforts resulting: heartburn, fermentation, belching, periodic vomiting, constipation, gastralgia, nausea, or anorexia.

Conversely, a disturbance in gastric function may induce headache, vertigo, and ocular discomfort; and by reestablishing normal gastrointestinal motility, relief from these symptoms has resulted. Dr. Robert Keeton advises for this purpose the ingestion one hour before meals of a powder containing fifteen grains each of sodium bromide, sodium bicarbonate, and disodium acid phosphate. I have used this prescription in suitable cases with most satisfactory results.

As fallacious deductions have been made so often from clinical experiences, the profession as a whole has been loath to accept this apparently far-fetched interrelationship of eye and stomach. Of late, however, corroborative evidence from the laboratory has been forthcoming. Controlled experiments not only support the clinical evidence of this interrelationship, but clarify the nature of these reflex effects.

In 1927, Pearcy and Allen[4] definitely established the occurrence of reflexes from the gastrointestinal tract to the eye. A stomach balloon was swallowed and connected to a water manometer. From time to time, the air pressure within the balloon was increased, its degree noted, and the amplitude of accommodation studied. With overdistension of the stomach there regularly occurred a fall in the amplitude of accommodation.

In my personal experiments, I

Fig. 1 (Lebensohn). The general set-up of the apparatus used. The tube leading from the mouth to the manometer comes from a balloon in the stomach.

studied the effects on gastric motility of various agents influencing ocular function. Motility is probably the most important attribute of the stomach. Clinically, this function is studied by noting the gastric emptying time by means of x-ray and stomach tube. In the laboratory a more delicate method is employed, which is more suitable for the fairly rapid changes involved in a nervous reflex. A stomach balloon, connected with a water manometer, is swallowed, and a tracing made on the smoked paper of a revolving kymograph. A slowly moving double-drum kymograph was used in this work, so that the tracing could continue for one and a half hours before requiring a change of smoked paper. The arrangement of the apparatus is shown in figure 1; and a close-up of the manometer, with the attached balloon inflated to two inches water pressure, is shown in figure 2. The balloon is, of course, emptied of air before being swallowed, and is inflated to this degree after it has reached the stomach.

As described by Carlson[5], the empty stomach normally passes through a cycle of three phases of activity: (a)

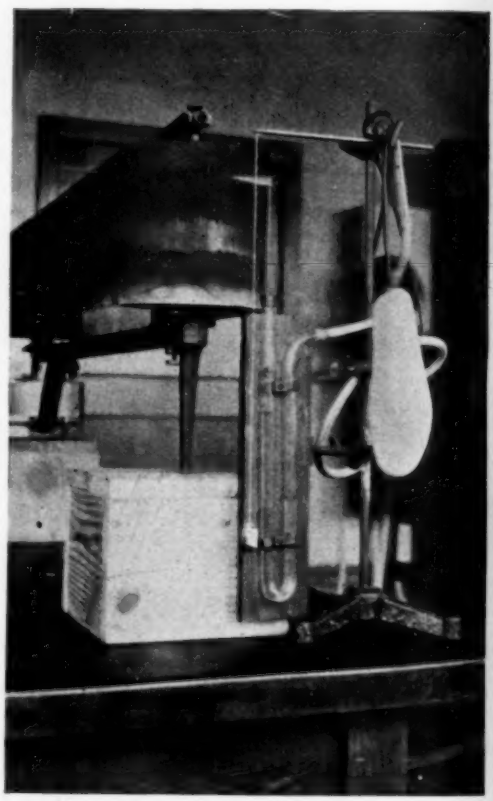


Fig. 2. Detail of apparatus, showing the stomach balloon (inflated) and the manometer.

a period of relative motor quiescence, which lasts from a half to two and a half hours in normal adult persons; (b) a period of tonic rhythm lasting generally thirty to forty-five minutes, with gradually increasing amplitude ending in (c) "a hunger period" of powerful rhythmical contractions, "the hunger contractions". This last period may or may not end in tetany, and is followed by abrupt relaxation and quiescence. Tetany when present lasts two to five minutes. In the normal individual, the gastric hunger contractions begin even before the stomach is empty, and continue in the absence of inhibitory processes as long as the stomach remains empty, irrespective of the time of day or night, and without regard to the hour at which the individual is accustomed to eat.

In my first series of experiments, I studied the effect of various refractive errors on gastric motility. I read continuously throughout the course of an experiment; after thirty minutes I would slip on a trial frame containing various lenses and would read with them for a similar period; after which I again read with the error removed as at the beginning. The same experiment would be varied on a following day by wearing the error at the beginning and end of the period, with an interval of thirty minutes normal reading between.

In figure 3 is shown a section of a tracing of gastric activity fifteen minutes before and after removal of the error. The error worn was R.—0.50 cyl. ax. 120°; L.—1.00 cyl. ax. 30°. Note that with the removal of the error there forthwith occurs a definite increase in gastric activity.

In relation to figure 4, the following error was worn: R.—1.00 cyl. ax. 30°; L.—0.50 cyl. ax. 120°. At the beginning of the tracing the stomach is in slight tonic rhythm. With the removal of the error there is a marked increase in the gastric rhythm.

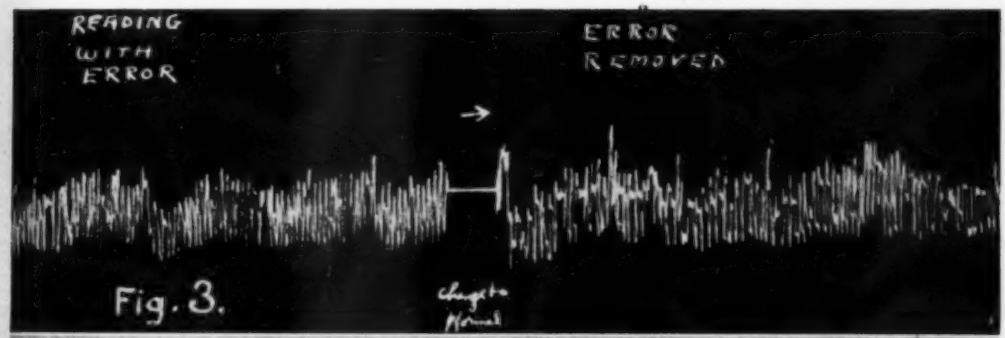


Fig. 3. (Lebensohn). At the beginning of the tracing, the following error is worn: R.—.50 cycl. ax. 120°; L.—1.00 cyl. ax. 30°. Note the change in gastric activity after removal of the error.

Fig. 4. At the beginning of the tracing the following error is worn: R.—1.00 cyl. ax. 30°; L.—0.50 cyl. ax. 120°. With the change to normality, note the increase in gastric rhythm.

The error used in these two experiments is based on a case recently reported by Crisp[6] of important gastric symptoms relieved by correction of a low refractive error. In my other protocols the errors worn have likewise been based (for the most part) on clinical records of gastric distress associated with asthenopia. I am personally not subject to headache or to gastric complaint, so that it is noteworthy that I demonstrated an ocular reflex to the gastric mechanism with these errors, though they failed to induce in me any subjective symptoms.

The wearing of lenses simulating simple myopia or simple hypermetropia produced in me apparently no change of gastric motility.

I next experimented with prisms instead of errors of refraction. In relation to figure 5 I wore a two-degree prism base up over the left eye. On removal of this there was an increase in tonic rhythm, which culminates at the end of the tracing in hunger contractions.

In relation to figure 6, a three-degree prism base down was worn over the left eye. The stomach was in a hunger period. On removal of the induced muscular imbalance, there is a prompt increase in gastric tone and activity.

In relation to figure 7 a ten-degree prism base in was worn over the left eye. With the removal of this, gastric activity increases, culminating at the end of the tracing in hunger contractions.

A modification of these experiments

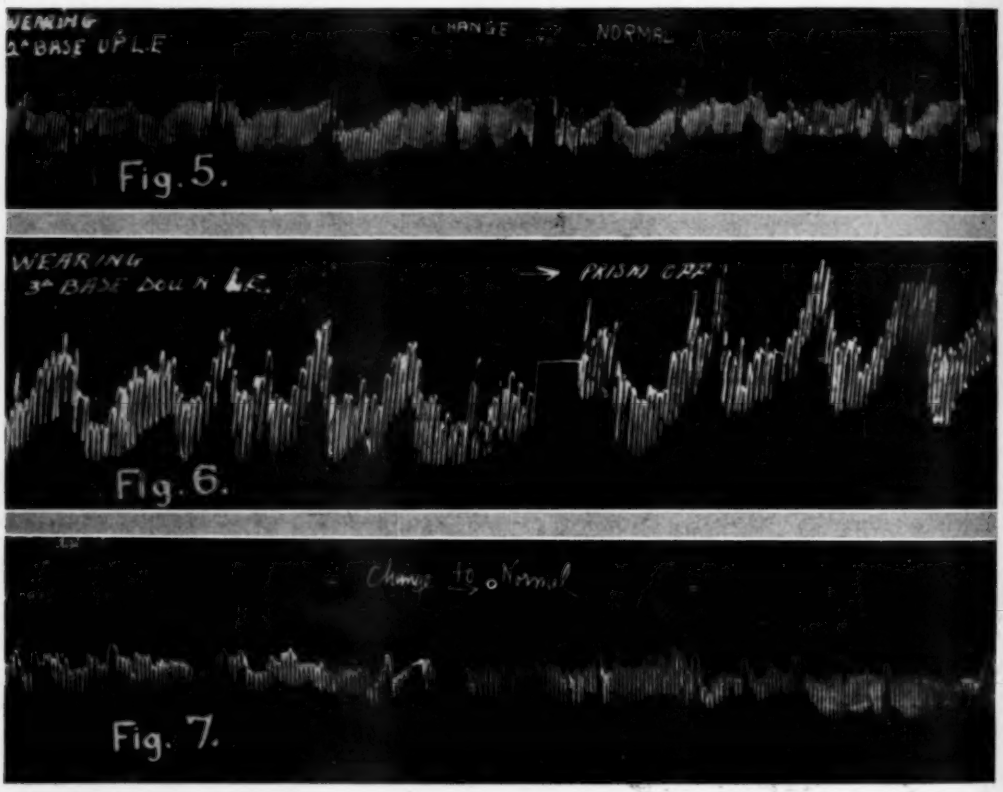


Fig. 5. (Lebensohn). Note that on removal of the prism, there is an increase in tonic rhythm which at the end of the tracing culminates in hunger contractions.

Fig. 6. The stomach is in a hunger period. On removal of the induced muscular imbalance, there is a prompt increase in gastric tone and activity.

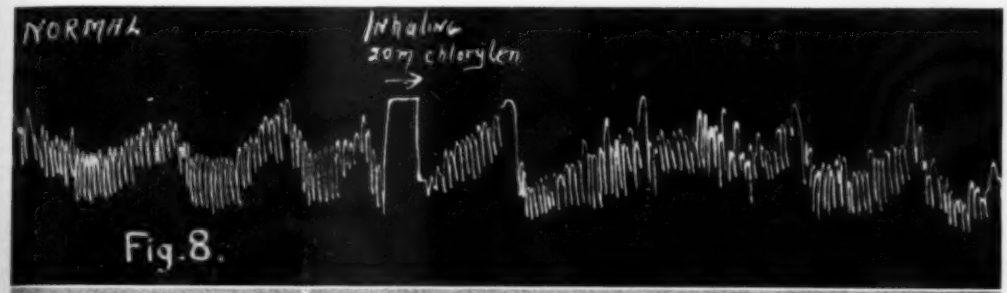
Fig. 7. With the removal of the prism, gastric activity increases, culminating at the end of the tracing in hunger contractions.

in which reading was performed with one eye covered produced no change of gastric activity with the placing or removal of prisms over the uncovered eye.

From these experiments it appears that errors of refraction or of ocular muscle balance reflexly exert a repressive effect on the motor function of the stomach, and that with removal of these asthenopic irritants there is a release from inhibition. From physiological considerations it is apparent that this irritative reflex would be mediated by the trigeminal and splanchnic nerves.

Not all ocular irritants induce this gastric reflex. Eserin salicylate two per cent was instilled in each eye just after the onset of a strong hunger period. In spite of marked twitching and visual blur, the gastric contractions continued with full and unabated vigor.

During the war a specific anesthetic for the fifth nerve was discovered in trichlorethylene, now marketed under the name of chlorylen (Oljenick[7].) Inhalation of twenty to thirty drops from a handkerchief until the odor is no longer perceptible allays the pain of trigeminal neuralgia. It has been possible by inhalation of chlorylen to diminish the sensibility of the cornea, and thereby relax the troublesome blepharospasm that often accompanies disease of the cornea and of the iris (Hildesheimer[8].) If the assumption that the trigeminal nerve sends inhibitory impulses to the splanchnic is correct, inhalation of chlorylen should have a tonic rather than an inhibitory effect on gastric motility. The tracing in figure 8 confirms this view. At the end of the period shown, another twenty minims of chlorylen was inhaled, whereupon a sense of exaltation was experienced, while the gastric contractions continued in full force.



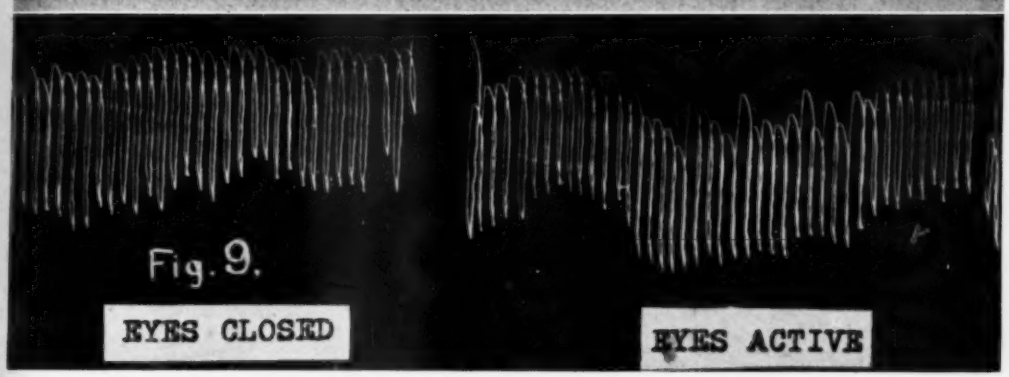


Fig. 8. (Lebensohn). Inhalation of chlorylen (trichlorethylene) shows a tonic effect on gastric motility.

Fig. 9. Visual function itself is tonic to gastric activity. On reading after the eyes have been closed for a period, an increased activity is regularly noted.

Whereas trigeminal nerve irritation is inhibitory to the stomach, the visual function itself is tonic. As illustrated in figure 9, on reading after the eyes have been closed for a period, an increased activity is regularly noted.

Though I have referred to pressure on the eyeballs, I have not experimented enough in this respect to report on the results. In the future I hope to study also the relation of induced ocular nystagmus to gastric activity. "Car sickness" probably can be explained on this basis better than by invoking the idea of a supersensitive labyrinth.

Conclusion

That reflexes occur from the eye to the stomach, and from the stomach to the eye, has now been experimentally established. As a corollary to these findings, closer cooperation should result between gastrologist and ophthalmologist, particularly in the control of functional gastric disorders.

I am indebted to Professor A. J. Carlson, director of the physiological laboratory at the university of Chicago, for his interest and cooperation in this work, and for the generous manner in which he has placed the facilities of his laboratory at my service.

25 East Washington street.

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COMPLICATIONS IN CATARACT EXTRACTION

A consideration of focal infections and diabetes

C. W. RUTHERFORD, M.D., F.A.C.S.

Cataract extractions on one hundred patients in the department of ophthalmology of the State University of Iowa hospital and college of medicine are analyzed as to the incidence of focal infections (mostly dental in origin), diabetes, high sugar tolerance curves, and combinations of these factors. Also considered are the influence of season, of previous removal of cataract from the other eye, of syphilis as indicated by Wassermann and Kahn tests, and of age. Read before the Chicago Ophthalmological Society, February 18, 1929.

A state law provides that all indigent and semiindigent persons of the state shall come to the university hospital for treatment at public expense when ill. The following observations were derived wholly from this class of patients, in whom a relatively high group incidence of focal infections, diabetes, nephritis, and so forth may be expected.

The series herein reported was studied with reference to the incidence of focal infections, mostly dental in origin, diabetes, high sugar tolerance curves, and combinations of these factors. From the records of the past two years the histories of one hundred patients with senile cataract, with or without diabetic features, were found suitable. This number is comparatively insignificant, yet it represents a cross section of one stratum of about 2,500,000 people distributed over an area of over 56,000 square miles.

As to age, 20 patients were in the sixth decade, 32 in the seventh, 34 in the eighth, and 14 in the ninth. No patient younger than fifty years was considered.

Of the one hundred patients oral sepsis was present in 53, suspicious in 26, and absent in 21. Diabetes was present in 24, some degree of low sugar tolerance was present in 22, and both were absent in 54. The table shows how each of these conditions or their combinations were found in ninety per cent of the series. The classification is based on the duration of postoperative hospitalization.

The shortest average hospitalization among the affected groups was in that, including twenty-nine per cent, with oral sepsis but negative diabetes, while the longest was in that, twelve per cent, with only suspicious oral sepsis and negative diabetes. It is to be observed that in the first group, ten per cent, with both oral sepsis and diabetes, the average hospitalization, 16.6 days, is only 1.3 days more than the general average of 15.3 days. It is only by comparing all affected groups with the negative group that one is impressed with the importance of these preoperative complications. It is worthy of note that hospitalization increased steadily in proportion to advancing age, as shown in the last line of the table.

Bilateral extractions were done for forty patients; eight times in those of the sixth decade, nine in the seventh, eighteen in the eighth, and five in the ninth. Of these the periods of hospitalization for the two eyes were equal in five patients, one or two days longer for the second period in ten, and one or two days longer for the first period in seven. Such small differences are without significance in our experience. In twelve patients the second period occupied an average of 9.0 days more, while in six it required an average of 5.2 days less. In six of these eighty extractions there were significant delays in discharging the patient; five of the six occurred in connection with the second operation. In eight additional patients an extraction was done on one eye when the other was already aphakic. No conclusions about sensitization can be drawn from any of these comparisons.

The blood-Wassermann tests showed positive reactions (of four plus) in five of the one hundred patients. These ranged in age from 58 to 78 years and

they had postoperative hospitalization of 12, 10, 19 (hemorrhage), 12, and 11 days respectively, with an average of 12.8 days. This is below the average shown by any group in which only focal infection or diabetes was a factor. Two of these patients had focal infections, two were negative, and one was questionable. None had diabetes, but one had low sugar tolerance.

the total number for three-fourths of the year showed little seasonal variation. On the basis of this moderate series of cases, there appears to be no reason for considering the seasons important.

In two cases enucleations were performed. The first was in a man aged eighty-five years; his remaining teeth had been extracted prior to operation,

Complication	Basic data	Age groups				
		50–59	60–69	70–79	80–87	Total
Oral sepsis and diabetes (10 patients)	Number of extractions	5	4	2	1	12
	Average days in hospital	13.6	17.5	13.5	34.0	16.6
Oral sepsis and high blood sugar curve (14 patients)	Number of extractions	3	11	4	8	26
	Average days in hospital	11.7	13.0	14.7	19.0	14.9
Oral sepsis and no diabetes (29 patients)	Number of extractions	9	6	16	6	37
	Average days in hospital	13.5	13.0	15.2	13.7	14.1
Oral sepsis indefinite and no diabetes (12 patients)	Number of extractions	4	4	11	1	20
	Average days in hospital	17.5	14.5	23.8	13.0	20
Oral sepsis indefinite or absent and diabetes (14 patients)	Number of extractions	1	8	8	1	18
	Average days in hospital	17.0	14.2	13.4	22.0	14.4
Oral sepsis indefinite or absent and high blood sugar curve (11 patients)	Number of extractions	3	5	3	1	12
	Average days in hospital	14.3	14.8	19.7	17.0	[illegible]
Oral sepsis absent and no diabetes (10 patients)	Number of extractions	3	3	8	1	15
	Average days in hospital	11.7	11.3	11.7	15.0	11.9
Summary (100 patients)	Number of extractions	28	41	52	19	140
	Average days in hospital	13.9	14.0	16.4	17.5	15.3

(Note: "Average days in hospital" means from date of operation to date of discharge.)

The average number of days of hospitalization for the various months of the year was studied because of its bearing on seasonal influences. The average by months was maintained close to the general average of 15.3, except that sixteen patients operated on in September required an average of 1.8 days more each, while sixteen patients operated on in February and March combined required an average of 2.1 days less each than the general average. The remaining two-thirds of

the conjunctival smears showed staphylococcus albus, and he had a mil seborrhea. The infection was discovered on the fifth postoperative day. The second enucleation was in a diabetic woman aged sixty years. She was discharged ten days after operation. Nineteen days later the eye became inflamed and painful.

Conclusions

The systematic study of one hundred patients in whom 140 cataract extrac-

ions were performed under practically identical conditions justifies the following deductions:

1. The season had no appreciable influence on the results.
2. The previous removal of a cataract from either eye, in forty-eight patients, gave no evidence of sensitizing, or otherwise influencing the postoperative behavior of, the second eye.
3. Syphilis, as shown by Wassermann and Kahn tests, in five patients with or without focal infections, had no apparent effect on the duration of hospitalization.
4. Focal infections, diabetes, and low sugar tolerance prolonged the convalescent period in a manner consistent with impaired recuperative ability.
5. As age advanced the rapidity of recuperation declined.

State University of Iowa.

OFFICE TRAINING IN OPHTHALMOLOGY

ARTHUR E. EWING, M.D., F.A.C.S.*
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In response to some general questions, Dr. Ewing wrote this account of the plan of the elder Dr. John Green for training assistants for his private office and for clinics with which he was connected. Drs. J. W. Charles and W. H. Luedde helped gather data regarding such assistants. This account was received a few days before Dr. Ewing's death.

Dr. John Green's method, in preparing so many younger men in ophthalmology, was substantially this: He gave them every opportunity in a practical way to acquire ophthalmic knowledge. In this he was usually suggestive, never pedantic or dictatorial. Great stress was laid on the diagnosis and the treatment of disease, and on the proper and accurate correction of refraction. Operations were looked upon as a last resort, rather than as a first choice, and were encouraged only when necessary; although he had a perfectly steady hand, was a very skilful operator, and was thoroughly acquainted with all operative procedures.

In an unofficious manner the burden of responsibility was so wisely placed on the assistant that the assistant soon became aware of the fact that he was an important factor in the work of the office and of the clinics. This work included everything in the ophthalmic line. The private practice was large, and the assistant was next to Dr. Green in its management. Also the clinics at Saint Luke's hospital and at the Saint Louis medical college, now Washington university, were under the direction of Dr. Green and Dr. Post, and it was the duty of the assistants to care for these clinics.

In addition to his willingness to give advice in any case, his library was open to any of the assistants at all times. It was a good ophthalmic library, containing most of the works on ophthalmology up to date, and many of the current journals.

Dr. Green began this training in 1878, with his first assistant and later associate, Dr. M. H. Post, who was an A.B. in Washington university and an M.D. of the Saint Louis medical college, and had served a year or more at the Saint Louis city hospital, and several years in private practice. Dr. Green preferred that each assistant should be in the office for three years. Many of them served one or two years with Dr. Post, or with Dr. Ewing, who succeeded Dr. Post, and a year or more with Dr. Green. He expected that each of those who had the advantage of such an opportunity should render him and the office any service possible in the work of the office and of the clinics. After leaving him he hoped and expected that his assistants would assume responsible positions in ophthalmology in the

* Died January 26, 1929.

communities in which they might locate. In this he was not disappointed.

His attitude toward subsequent study in Europe was that he preferred that each assistant should finish his ophthalmic training with six months or a year at some of the European universities, because of the better facilities for studying the pathology of the eye in Europe. Also he felt that observing the work of other eminent men would establish for them an intelligent confidence in their own ability. Many of these assistants he aided financially while taking the European course.

The preparation he expected before taking any one in his office was the usual medical course at a reputable medical college. The number who took his course and assisted Dr. Green was twelve. Adding those who were directly connected with the office as the assistants of Dr. Post and Dr. Ewing, and also those who were indirectly connected with the clinics but who always looked upon Dr. Green as their chief, and were under the influence of his conservative but progressive ideas, the total number who received such training was twenty-six.

DEFECTS IN OPHTHALMOLOGIC TRAINING

EMORY HILL, M.D., F.A.C.S.
RICHMOND, VIRGINIA

While it is legitimate to combine ophthalmology with otolaryngology, the former should not be a mere appendage to the latter. Perhaps the chief defect of preparation in ophthalmology is inadequate training in refraction, although refraction is of supreme importance concerning a large majority of those who consult ophthalmologists. Among other aspects of ophthalmologic practice which do not always receive the attention they deserve are the ever increasing need for cooperation with the internist and with other special branches of medicine; and neurologic ophthalmology. Ophthalmologists in this country should avail themselves increasingly of the excellent postgraduate courses provided in various cities of the United States. Read before the South Carolina Society of Ophthalmology and Otolaryngology.

The practice of any branch of medicine undergoes evolution, no doubt subject to definite laws. An understanding of the history of this evolution in the past, though incomplete, helps us to become oriented in our day as practitioners of ophthalmology and even to forecast something of the future of our chosen field of work.

Several facts stand out clearly in the history of American ophthalmology. It was, first of all, a surgical specialty. The opportunity for a beautifully precise technique and spectacular results, both visual and cosmetic, appealed to the early surgeons. Of course, they covered a wide field; they practiced medicine as well as surgery, but those who gradually narrowed their interest to ophthalmology were chiefly concerned with the surgical aspect of the subject, and those who declined all practice which did not concern the eye liked to be known as ophthalmic surgeons. Even today the staffs of ophthalmic hospitals are called surgeons, and in medical colleges ophthalmology is considered a surgical specialty.

The next significant step in ophthalmology came through the far-seeing wisdom of a neurologist whose experience convinced him that a relationship existed between headaches and errors of refraction. It is appropriate that we honor the memory of Weir Mitchell, who over fifty years ago called attention forcefully to the subject of eye-strain, and much credit is also due to those ophthalmologists of Philadelphia who demonstrated the possibility of greater occuracy in refraction work by making use of atropin for complete cycloplegia; guided

by the principles of physiologic optics in their application to the human eye as laid down by Donders in his classic work in 1864. The result was a practical demonstration of the tremendously important fact that errors of refraction are responsible for a large amount of suffering and incapacity. The Philadelphia profession raised the science of refraction to a high level of exactness which has been a model for the rest of the world. Though never fully appreciated in some quarters and relegated to the background by the more tempting prospects of surgical work in our own and allied branches, it remains the most notable example of exact science applied to daily medical practice of which our profession can boast.

The rise of specialism is too large a subject to treat here; but certain developments relating to ophthalmology may be noted and certain unsatisfactory results acknowledged. Obviously the entire field of medicine can not be covered by any one man, and especial interest in some phase of this vast field means more knowledge in the course of time and such knowledge is not hidden from the profession or the public. Thus specialism, which means special learning and skill, came inevitably with the scientific progress of the last half century.

But there is a specialism which is created artificially to meet the conventional demands of a community, or to gratify a desire for an easier and a more lucrative career. A man can be a specialist by christening himself a specialist, or he may be christened by a postgraduate school whose motto is "speed" and whose aim is quantity production. The result is a smattering of surgical technique and a confused idea of a multiplicity of drugs.

It would be unfair to blame our profession for trying to serve the public and to better its own none-too-good financial status. I do not maintain that the evils of specialism could have been entirely avoided. I do not plead for any elaborate system of training in research before a man practises a specialty. I do not even ask that we limit ourselves altogether to ophthalmology; this would not be feasible in every community, and the possibility of doing honest and faithful work in ophthalmology and otolaryngology combined is abundantly proven. I would, however, make a plea for the recognition of certain fundamental requirements for the adequate pursuit of ophthalmology.

First, ophthalmology is too important to be a mere appendage to otolaryngology. If the former is of no interest it should be abandoned. One has a perfect right to detest refraction work, provided he lets it alone, but the specialty suffers from its inclusion in the routine of men who have no liking for it and give it only perfunctory attention.

Refraction is of supreme importance concerning the large majority of those who consult us as ophthalmologists. Sixty-five years ago the principles upon which this work is based were clearly demonstrated by Donders. Our predecessors applied these principles, making use of cycloplegia and careful objective tests together with attention to the extraocular muscles. Their experience is available today and will enable us to give satisfaction to more than ninety per cent of our refraction cases, the remainder being cases which for some reason we cannot follow to a conclusion or which suffer from other conditions that render comfortable use of the eyes impossible.

Perhaps the chief defect of our preparation in ophthalmology is the inadequate training in refraction. He is an exceptional individual who can learn to do first-rate refraction in less than a year of constant work under the guidance of an expert. Yet this is just the class of work which is too often considered elementary, and many a man who calls for help when confronted by other difficulties would be ashamed to ask for consultation on a refraction case.

I would suggest that this situation needs most frank and honest consider-

ation by our societies. We may ridicule the optician, we may damn him eloquently and we may deplore his persistent efforts to gain legal recognition, but we shall not make headway in solving the real problem, namely how to care for the eyes of the public, unless we as a profession do consistently better refraction work than he does.

Another phase of ophthalmic practice is the eye-ground diagnosis which concerns patients who are primarily complaining of their eyes and also a considerable group who come to us at the behest of family physician, internist, neurologist, obstetrician, and so on. These cases demand experience and care; they also demand for their solution the constant coordination of ophthalmic with general pathology, the cooperation of the ophthalmologist with all of these colleagues. There is less and less excuse for the isolated practice of a specialty. Medical ophthalmology is assuming larger proportions, and this means collaboration between ophthalmology and other branches.

Considering another aspect of the picture, we find inflammatory diseases of the eye no longer presenting a local and isolated problem cared for adequately by the specialist. Intraocular disease is a medical problem to be directed by the medical man with all possible help from various sources. The recognition of the ocular disease and the inauguration of local treatment is the ophthalmologist's duty, but his exclusive care of such a case is grossly inadequate in the light of present-day knowledge.

Neurologic ophthalmology deserves more serious attention. The neurologist knows that the second pair of cranial nerves can not be ignored in the study of a disease of the central nervous system. We must also learn that the visual mechanism is an integral part of the brain and that the understanding of intracranial disorders may require more than the use of the ophthalmoscope. The perimeter and campimeter are instruments of great value and their frequent use is a habit worth cultivating.

Ophthalmic surgery is becoming more limited. The better care of the eyes of young people, the eradication of many foci of infection in youth and adult life, safety devices to prevent trauma, better lighting conditions, and other less understood factors may be credited with this change. We have fewer squint cases for surgery than our predecessors, less traumatic and plastic work, and fewer cataracts. At the same time, the number of surgeons has increased enormously, so that the individual's experience tends to be more restricted. The importance of our surgery, however, is not less, and the improvements of technique, safety measures, and the more extensive and more efficient use of local and infiltration anesthesia demand our continuous study and adoption.

Covering all of these fields of special activity are postgraduate courses now available in this country whose excellence is not generally appreciated. If, for ourselves or for the young men wishing to join our ranks, we will investigate these possibilities for training in ophthalmology, we shall see that there is no longer an excuse for lack of training. I need but mention the work done at Pennsylvania, Harvard, Michigan, Minnesota, and Colorado, in addition to the older postgraduate courses not under university supervision.

It is not improper, I believe, to call attention to the absolute necessity of demanding adequate fees for work in ophthalmology if the profession is to give this subject the necessary time and study. This is especially true in the South, where all medical work is underpaid.

If this survey of our situation is anywhere near correct, may we not foresee the tendencies in ophthalmic practice for our own benefit and for that of the oncoming generation to whom we owe some guidance?

I take it that refraction must be done with the utmost care. Whatever

the public decides, through its lawmakers, in the matter of legal qualification and licensure, the ophthalmologist must be able to practise the science as well as the art of refraction. In medical and neurologic ophthalmology we must expect our separate and individual function to decrease while our cooperative function as part of a diagnostic group will increase. We shall aid in the diagnosis and treatment of many conditions which appear chiefly as ocular complaints but have widespread ramifications, or which come to us only for a small and highly technical bit of study. We shall use, with a fair degree of certainty of their effects, a few drugs which experiment and experience show to be of value, giving scant attention to the many panaceas heralded by manufacturing drug houses. We shall be expected to exercise a duly conscientious attitude toward our surgery. Obviously, we must keep abreast of the advances in surgical technique; but we must recognize the fact that not every ophthalmologist can acquire skill in all varieties of ocular surgery. It is a question whether many of us have a right to attempt plastic surgery in communities where there are others who have had large experience during and since the War. It is a legitimate question to ask whether the public would not be better served if the surgical material at the disposal of a number of ophthalmologists in a community were referred to one ophthalmic surgeon, or to one trained in general surgery and who, while not an ophthalmologist, had been induced to acquire special training in the technique of ophthalmic surgery; in place of the present custom which allows every ophthalmologist to do the small amount of operating which comes his way. In any event the old custom of operating upon an eye without having the patient investigated from the medical standpoint cannot be tolerated. Whoever does the surgery, the patient must be as free as possible from the common focal infections. The only exception will be the emergency in which delay would mean the loss of an eye.

The changing status of ophthalmology need not discourage us. So long as nephritis, arterial hypertension, toxemias of pregnancy, headache, brain tumor, encephalitis, syphilis, tuberculosis, and a great number of small foci of infection continue to afflict the race, and some eyes are doomed to glaucoma, there will be work for us to do, work which brings us into relation with the large problems of medicine. A desire for exact knowledge will be satisfied in many aspects of a remarkably exact branch of science, and a curiosity to learn more will find ample material for its exercise in the unsolved problems which will vex a few more generations of ophthalmologists.

Professional building.

ROTATION PLANES IN FACIAL ASYMMETRY

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MINNEAPOLIS

The not infrequent occurrence of marked facial asymmetry with retention of binocular single vision suggests that some current conceptions with regard to heterophoria are not altogether accurate. The determining factor is the relation of the radial axes to their common plane of rotation. Heterophoria or orthophoria may occur in planes that are either horizontal or tilted. The writer suggests the use of the term hyperophthalmos or hypoophthalmos to designate an actual higher or lower position of either eye, and hyperversion or hypoversion to indicate an incorrect position of the visual axis of one eye in relation to the other. The same eye may be hyperophthalmic and hypoverted. Read before the Minnesota Academy of Ophthalmology and Otolaryngology, April 12, 1929.

Marked facial asymmetry with retention of binocular single vision needs must lead to the suspicion that error may exist regarding some of our conceptions of heterophoria. In usual considerations of heterophoria there is a natural tendency to regard the merely apparent, or actual, elevation of one of the horizontal planes as sufficient to establish its identity. A study of facial asymmetry leads to the conclusion that this conception of heterophoria has much within it of error, and shows how artificial and diagrammatic our ideas regarding the eye movements are.

Conclusions have been drawn too much from geometric conceptions, rather than from clinical and physiological evidence. But even here, the diagrammatic and geometric align themselves consistently with physiological and clinical phenomena, when drawings are made in conformity with the facts.

In the presence of binocular single vision, and for all directional lines of the visual axes, even with difference in level of the horizontal planes of the eyes, manifest heterophoria is nonexistent. The relation of the visual axes to their common plane of rotation is the determining factor as to the presence or absence of heterophoria, and not the relationship of the separate horizontal planes. One horizontal plane may be higher, the other lower, than the horizontal plane of the head, which is at right angles to the vertical head plane.

Noncoincidence of the horizontal planes of the two eyes is not uncommon, and may be evident to simple inspection in cases of facial asymmetry. This is particularly noticeable in the extreme case of the author's here illustrated, and yet in this case binocular single vision may be clearly proved for all points of fixation throughout the combined visual fields.

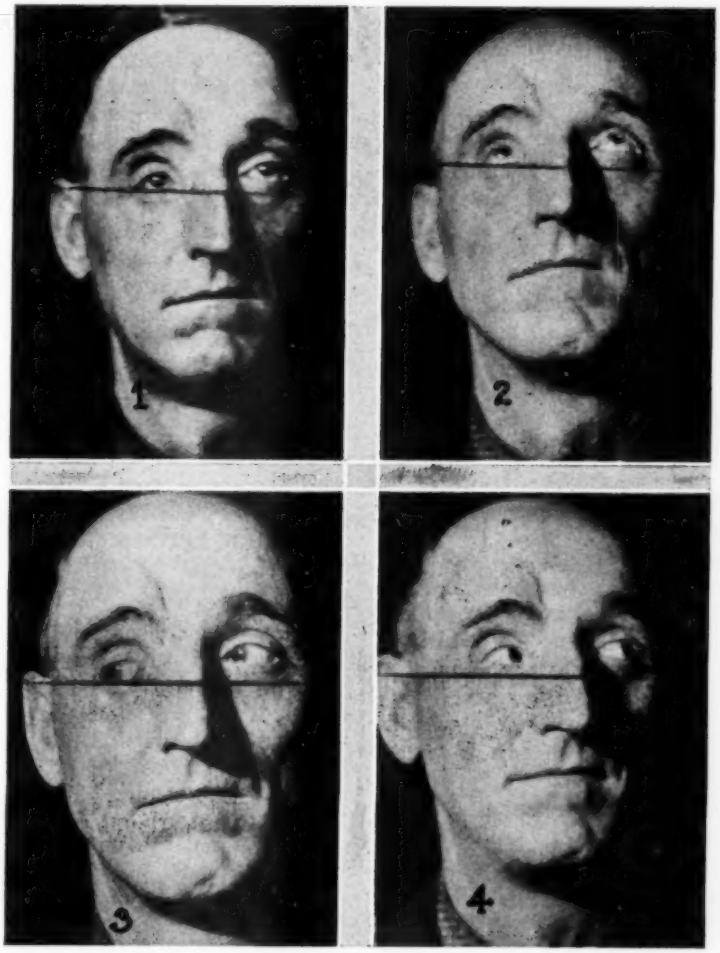
The base line conecting the centers of rotation of the two eyes is the axis of revolution for their common plane, in which all excursions, divergent or convergent, may be made. The relationship the lines of fixation bear to this common plane is the factor that determines orthophoria or heterophoria.

So long as the visual axes, while fixing at a common point, remain in this common plane, within the excursional limits of the two eyes, we have orthophoria. The mere tilting of this plane away from its normal horizontal position need not provoke diplopia, or interfere with corresponding retinal identity, any more than when these axes are moving in a plane coincident with the horizontal plane of the head.

It is to be observed that, while the retinal meridians vertical to the fixed horizontal plane of the head are not vertical to the tilted common plane of rotation, still in each eye all of these meridians bear corresponding angular relationship to this plane in all positions, just as they do to the horizontal plane. This tilted plane is the visual plane of binocular single vision, since in this plane all normal associated movements take place with retention of perfect binocular single vi-

sion, which of course implies perfect retinal correspondence with normal projection.

We are thus too prone, in considering heterophoria, to visualize the position of one eyeball as it relates to the other, rather than to visualize no sense to be considered as necessarily indicating muscle abnormalities. Without doubt, all forms of abnormality may be found with difference in level of the two eyes, but it is to be repeated that this is in no sense the essential and determining factor.



Rotation planes in facial asymmetry (Morton): 1, line of regard forward; 2, line of regard up; 3, line of regard right; 4, line of regard left.

their relationship to their common plane of rotation. There is no great or essential value in the mere clinical determination of the elevation of one eye above the other when we are not reasoning in terms of the actual relationship of the visual axes to their common plane of rotation. Such conditions are simply personal anatomical idiosyncrasies, but are in

Heterophoria and orthophoria may occur in planes that are either horizontal or tilted. Dr. Edward Jackson, in correspondence with the author regarding extreme cases of this nature, very aptly states the pertinent facts as related to this class of cases: "The case you narrate is one of the most striking of those illustrating how artificial our diagrammatic conception of

the eye movement is. The eyes in this patient each having centers of rotation, the planes passed through these centers would contain each line of fixation. Only in this case the plane would not be perpendicular to the axis of the body. The plane could be rotated about the base line joining these centers, the visual axes moved to the right or left in this plane, converged or diverged. Only the plane does not happen to correspond to the usual position of binocular movements. It does not depend on any relation to vertical or horizontally erect position of the head or body, etc. Very rarely do they conform to any of these planes in directions that we hear so much about. There is no more need for having the eyes in the primary position to move them to any part of the field than there is for one of us to stand erect in order to raise his arm to the level of his shoulder."

It is to be observed that analysis of the relation existing between the tilted, yet common, plane of rotation and the two lines of fixation permits of an apparent paradox: the apparently lower eye may be hyperphoric, and the apparently higher eye may be hypophoric. It is a matter that concerns the two lines of regard in their relationship to their common horizontal plane of rotation.

This permissible difference, or lack of coincidence, in the two horizontal planes, as each relates to the fixed horizontal plane of the head, is not difficult to understand when we refer to the like relationship of the two vertical planes of the eyes, as each is separately related to their common plane of fixation, which is always at right angles to the horizontal line connecting their centers of rotation.

Here we have each eye in a different vertical plane, and the presence or absence of lateral heterophoria is determined by the direction of these two converging planes toward their common point of fixation, which may be at any point in the visual field, as the visual axes depart from their primary position.

The determining factor, again, is found in the relationship of the line of regard, or visual axis, to its own plane, when directed at any given point of fixation. So long as each visual axis remains in its correct position in this plane, the same angular relationship exists between the line of regard in each eye and the base line connecting the centers of rotation.

When the axis departs from this plane outward, we have exophoria with increased angularity on that side between this line of fixation and the base line described. When it departs from this plane inward, we have decreased angularity and esophoria.

Just as these two vertical planes turning to the right or left do not produce lateral heterotropia, likewise difference in level of the horizontal planes of the two eyes as they relate to the horizontal plane of the head may not be attended with vertical heterophoria.

In all such cases occurring in facial asymmetry, and where accurate testing by the amblyoscope establishes the presence of binocular single vision, and the muscle tests reveal the existence of orthophoria, we have the two eyes working in their common plane, whatever its position, and through all their excursional movements, be it divergence or convergence, as normally as though this common horizontal plane was coincident with the horizontal plane of the head.

To carry the illustration to an extreme degree, it is possible to conceive that this tilting of the common plane might coincide with the vertical plane, in which case one eye would be vertically located to its fellow instead of horizontally.

It is possible that retinal identity and binocular single vision could be preserved throughout, and even that the eyes could occupy positions farther apart than they do, and yet preserve binocular single vision if the

length of the optic nerves and ocular anatomy permitted.

This imaginary example, of course, is based upon the assumption of an anatomical absurdity, and is simply stated to more strongly visualize the fact that the position of the common plane of rotation is not the determining factor. In all cases it is the relationship of the line of regard to the common plane in which it rotates.

In discussing ocular fixation and rotation in asymmetrical planes, it is to be noticed that skeletal deformity may exert an influence upon ocular position and rotation. Mills has considered this subject, and his investigations lead him to confirm the opinion of Steven, Risley, and De Kleijn, that the unsymmetrical shape of the skull may be the direct effect of overdevelopment of the motor area of the left cerebrum, to correspond with the racial prevalence of dextrality. In infancy there is a balanced bilaterality of cortical function for movements, which from racial training is suppressed or undergoes wrong development.

The examination of postural defects seems to clearly indicate their influence upon the position and degree of head-tilting, as well as variations in the location and size of the orbits, and attendant changes in the form of the globe and in its motor mechanism.

Stevens believed that the lack of asymmetry of ocular position associated with the cranial asymmetry brought about imperfections of binocular vision. Sherrington's work in this field led him to conclude that an altered state of the extrinsic muscles of the eyeball brought about alteration in muscular sensation in maintaining the eyeballs in their new postures.

It therefore appears to be quite a reasonable hypothesis that skeletal mechanics plays a very important part in cranial development, which of course involves the orbits. In line with this supposition, it is to be noted that with postural defects, related to craniospinal asymmetry there arise many defects of the left orbit, in the nature of its enlargement, and change of position in relation to the right, which factors of course may influence the position that the two eyes occupy as to the horizontal plane of rotation.

Sherrington emphasizes that spatial perceptions are by no means purely visual, but on the other hand are rather "visuo-musculo-labyrinthine". Mills believes that from basic skeletal faults spring orbital asymmetry and alterations in the position of the muscle attachments and muscle action of the eyes, that the left eye is mainly affected through its proximity to the larger left cerebral hemisphere and the larger left cranial fossa, and that there follows upon this the appearance more commonly of left hyperphoria.

However, interesting as these observations are from a phyletic standpoint, our consideration of asymmetrical visual planes indicates that the mere deviation of one globe from the horizontal plane does not always displace it from a common plane of binocular association, in which plane the two eyes may correctly function for the purpose of binocular single vision.

These observations must needs be accompanied by doubts as to the correctness and accuracy of the nomenclature that we now employ for designating muscle insufficiencies and paralysis. Such terms should be used as do not obscure in their comprehensiveness the actual position of each ocular plane, with the position occupied by its line of fixation in this plane. We should have a term to designate the height of one eye as related to the fixed horizontal plane of the head, and, aside from this, the correct term to apply to the positions of the visual axes in normality or abnormality.

At the present time we are apt to visualize right hyperphoria as a higher eye, when it may perhaps be simply a higher directional position of the visual axis, and this same reasoning may be carried throughout.

For this reason, the writer suggests the terms hyperophthalmos and hypoophthalmos to designate the actually higher or lower position of either eye, and the root "version", with its correct prefix, to designate the position of the visual axis of one eye as it relates to the other. Thus we may have hyperophthalmos of the right eye with existing hypoversion (now designated hypophoria).

1111 Nicollet avenue

NOTES, CASES, INSTRUMENTS

AN OPEN TUBE METHOD OF USING THE AMBLYOSCOPE

ERNEST E. MADDOX, M.D. Edin., F.R.C.S.
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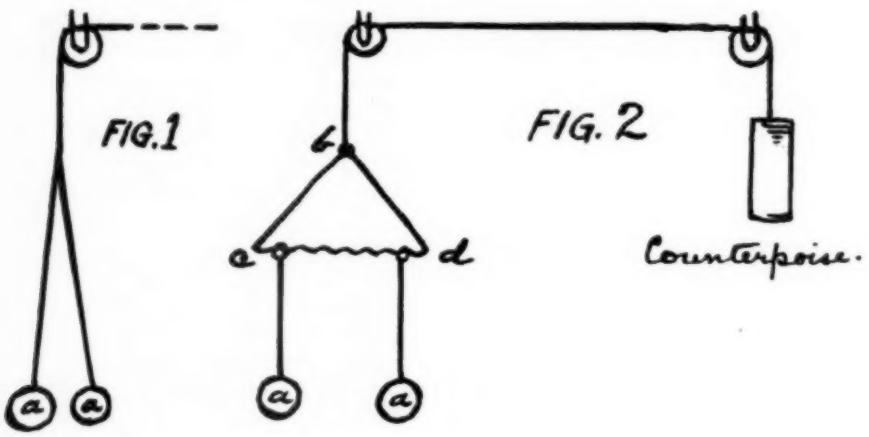
Users of Worth's admirably contrived instrument may like to know of an interesting extension of the exercises possible with it, which the writer recently hit upon.

As a variation from putting the bird in the cage, remove the bird, and place a —7.5 D. or —8 D. spherical lens in the cell attached to the fixed lens of the empty tube so as to neutralize it. Then the child's mother or friend can stand two or three yards off, adjusting her position so as to keep the end of the tube "end on" to her. She can then be apparently placed in the cage by the child, instead of the bird, unlike which she can make various movements—smile, frown, wear a hat, etc.—which the child can be asked to describe, as well as pictures, toys, teddy bears, dolls, motor cars, and the like. This is far better than the "still life" of a bird, which affords us less opportunity of knowing how much or little the eye is paying attention.

With the synoptiscope, which is really a mounted amblyoscope, the same maneuver is easier still, owing to its steadiness.

If the cage be removed and the bird inserted, one tube can be made to look at the garden while the other sees the bird in it. Numerous little devices will suggest themselves naturally. Even the pictures round the room can be utilized. In short, without further expense a new range of objects becomes available. If both tubes have their lenses neutralized and their pictures removed, two persons can stand at a distance from one another and be apparently brought together. When quite near each other, the binding screw which fixes the arc of Worth's original instrument can be tightened, allowing my



horizontal "fine adjustment" screw to come into play, with which the two people can be made apparently to kiss one another. The plan I introduced many years ago of suspending the amblyoscope from the ceiling with a pulley and counterweight keeps the child from dropping it and tires its hands less. The wavy cross-stick, with rings, shown in the figure is a further advantage when a convergent squint is being trained. Without it, the tubes tend to close together whenever the child's hands are relaxed, a motion which, of course, tends to train the squint in the wrong direction; with an adjustment of the rings to separate the tubes a little more than required for fusion, any slight relaxation of the hands trains it in the right direction.

In all these experiments the instrument should be held horizontally; otherwise, objects will appear inclined from the vertical owing to the tilting of the mirrors. For the open-tube experiments the amblyoscope would give a larger field if deprived of the remote part of each tube, but the gain would be too small to be worth making a separate instrument. In fact, a picture in a small circumscribed frame concentrates the child's attention more than if other objects are visible also.

Open-tube exercises are only of service to provoke simultaneous vision, or to break down acquired amblyopia; they do not exercise fusion, as Edward Jackson's ingenious "monoscope" does.

GONOCOCCUS INFECTION OF LACRIMAL SAC AS SOURCE OF REINFECTION TO EYES, NOSE, AND THROAT*

EDWARD BELLAMY GRESSER, M.D.,
NEW YORK CITY, AND
HUGH MCKEOWN, M.D., AUSTIN, TEXAS

An extensive survey of the literature reveals no reference to gonococcus infection of the lacrimal sacs and merely notations on the rarity of such an infection of the nose and throat. The following is a report of extragenital infection of the ocular conjunctivæ with subsequent relapse and with complicating infection of the nose, tonsils, and throat.

G.B., male, aged four years, admitted May 22, 1928. Temperature 106 degrees, respiration 47, pulse 120. History of swollen and discharging eyes for past few days. Physical examination: Lids of both eyes markedly edematous; profuse purulent discharge. Corneæ uninvolved. Nose: scant mucopurulent discharge. Ears: the left is markedly red, the skin indurated and covered with fine papulopustular lesions. The ear stands out at right angles to the head. There is a scant mucopurulent discharge from the ear. The right ear is negative. The tonsils are markedly hypertrophic, cryptic, and injected. The cervical glands are enlarged, especially on the left.

The remaining physical examination is negative, including the penis, except that over the face and neck there are a few papulopustular lesions pinpoint in size.

At the time the diagnosis was made of neisserian infection of the eyes; nonspecific acute left otitis media; acute tonsillitis; and dermatitis from the secretion.

Direct smears from the eyes at this time showed gram-negative diplococci extracellular. Blood culture and medium cultures of discharges from ears and tonsils were negative.

In ten days time under ordinary treatment the eye discharges disappeared. The left ear cleared up and the clinical picture warranted discharge from the hospital (June 10, 1928) though a slight mucopurulent discharge from the nares still continued.

Within three months the patient was readmitted with a recrudescence of practically the same symptoms except for the ear involvement, but with greater discharge from the nose. Smears taken from the lacrimal sacs

* From the ophthalmological division, Bellevue Hospital, New York City; Webb. W. Weeks, M.D., director.

under proper precautions to prevent contamination from outside were also positive. The eyes became ulcerated but were prevented from perforating. The conditions were carefully treated over a period of three months, with final curing of the eyes, whereas the nose still continues to discharge although the smears are negative. The tonsils are tremendously hypertrophied, sufficiently to interfere with the deglutition of solid matter.

In the early stages of the recrudescent period the infecting organism was recovered from conjunctival culs-de-sacs, lacrimal sac, nares, throat, and tonsils.

The lacrimal sacs being usually involved in conjunctival diseases, it is probable that the reinfection of the eyes had its nidus there, and that from the same source active organisms were also supplied to the mucosa of the nasopharynx, from which the tonsils and throat in turn received their infection.

39 Fifth avenue, New York.
Scarbrough building, Austin.

COLON BACILLUS INFECTION OF CONJUNCTIVA IN ADULTS

SARADINDU SANYAL, M.B.
CALCUTTA, INDIA

A not very uncommon form of conjunctivitis is seen now and then among the labor population of Calcutta during the routine bacteriological examination of cases of conjunctivitis. It has the following characteristics:

So far young men from twenty to thirty-five years have been seen. All the cases were in males. No special predilection for any season seems to exist. Race does not seem to affect susceptibility. Infection appears to be direct from the fingers.

Clinical symptoms: The attack begins as an ordinary conjunctivitis, and within a day or two it assumes a moderately severe character. The lids are red, swollen and tense, and are everted with great difficulty, the upper overhanging the lower to a certain extent. The bulbar conjunctiva is swollen and infiltrated. There is intense injection of the palpebral conjunctiva, which looks velvety. The cornea is surrounded by a ring of edematous conjunctiva which is raised above its surface. There is copious discharge from the eyes, which during the first day or two is mucopurulent, and later assumes a purulent character. No subconjunctival hemorrhage occurs. In spite of the severity of objective signs, there is surprisingly little pain. Only a dull brow-ache is complained of.

Corneal complications: Within the first four days, in some cases, the cornea becomes implicated. The ulcer begins as a small pin-point infiltrate at one side of the cornea, which quickly breaks down. The ulcer spreads centrally, first destroying the most superficial epithelium and then the deeper layers successively. At the same time the original area of infection becomes deeper and sloughs out; so that in an anteroposterior section of the cornea through an ulcer which is two or three days old it looks like the steps of a staircase, the highest step being the part most distant from the originally infected area. These sloughs are very loosely attached to the base and are easily detached. Once the cornea is involved the whole of it becomes affected within two or three days. But the deep penetration is a slower process and takes some time. The margins of the ulcers are clear-cut and no burrowing is seen. There is no hypopyon. Iritis is absent or very slight. With implication of the cornea the pain and photophobia also increase. But the pain is not very intense and is only intermittent.

Differential diagnosis from gonorrheal, pneumococcal, streptococcal, and Koch-Weeks infections is necessary. Smear preparation will show gram-negative bacilli which on culture will prove to be colon bacilli.

Prognosis: Fortunately the cases are readily amenable to treatment, ex-

cept in corneal implication, when the rapidity of the superficial extension makes the prognosis as regards sight rather bad.

Course: The conjunctivitis subsides rapidly under treatment, usually within three or four days. Corneal complications take two or three weeks to cure.

Treatment: Methylen blue (one grain to the ounce), yellow oxide of mercury, and acriflavin lotion are quite satisfactory. For intense edema tincture of perchloride of iron one dram to the ounce on a compress is very efficacious. For corneal ulceration a formula consisting of bismuth subgallate, orthoform, eserine, and vaseline is quite effective.

Conclusion: Although colon bacillus infection in infants and in the new-born has been recorded by Groenouw (six out of forty cases in the new-born), Bretti (the only organism in one case), and others, no case of adult infection appears in the literature so far as I could gather.

17-2 Beadon street.

SOCIETY PROCEEDINGS

Edited by Dr. Lawrence T. Post

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

January 11, 1929

Mr. Cyril Walker, president

Iris cyst?

Mr. Foster Moore showed a case for diagnosis. The patient had a lens which was becoming partly opaque and was pushed to one side. The man had keratitis punctata and what seemed to be a cyst, which was responsible for the lens displacement. There was no history of trauma, though one might have expected an accident to have been the cause. The presence of the keratitis punctata seemed to stamp it as inflammatory. It was a translucent growth. There appeared to be no intraocular foreign body. The tension of the eye was not raised.

Discussion. Mr. Mayou spoke of a somewhat similar case of his own, in a child who had a cyst of the pigment epithelium of the iris.

Mr. Humphrey Neame thought it possible that the keratitis punctata was due to lens matter. Some years ago he reported, pathologically, a case of cyst of considerable size in a man who members thought had a new growth of the choroid. On section of the eyeball afterward, however, the mass proved to be a cyst, and it had been dark to transillumination because it contained blood, a possibility to be borne in mind.

Albuminuric retinitis

Mr. J. H. Cook showed a woman who considered she was in good health, and said that deterioration of vision dated only a fortnight ago. The case showed sheathing of one of the vessels by exudate.

Proptosis from ethmoidal cyst

Miss Margaret Dobson exhibited a case of cyst of the ethmoidal labyrinth causing proptosis, the patient being an ex-service man, aged thirty years. In October, 1925, he had complained of gradual and painless protrusion of the left eye. The proptosis was forward and downward. The tension of the eye was slightly plus. After sneezing, a slight quantity of brown fluid was discharged through the nostril, and dripped for half an hour. After it ceased there was less protrusion of the eye and the double vision which he had had disappeared. On pressing between the eyeball and the inner orbital wall, a buckling could be felt. The radiograph showed

that the ethmoid cells on the left side were distended.

Central choroiditis

Miss Rosa Ford exhibited a man whom she had first seen in 1920, and had then been forty-nine years of age. He had a small patch of central choroiditis in the left eye. Vision was 5/60. Wassermann being slightly positive, the man was referred to his doctor for treatment. In 1923 Miss Ford saw him again, as he was complaining of the other eye, and in it there was a small patch of choroiditis close to the fovea. Vision in this second eye was 5/9. There was now a large area of choroidal atrophy. Blood showed a negative Wassermann now on two occasions; cerebrospinal fluid was also negative. Dental sepsis seemed not to have anything to do with it, though he was given an autogenous vaccine derived from septic stumps. Several physicians had examined the patient, but failed to find anything wrong, and three nasal surgeons agreed there was no nasal sepsis. Radiological examination proved negative. After resection of the septum in 1924, the vision improved and the spread of the choroiditis was checked. Miss Ford had at first thought it to be retrobulbar neuritis. She asked for suggestions as to etiology, but the case was not discussed.

Argyll Robertson pupil from trauma

Mr. E. Woolf showed a case of bilateral Argyll Robertson pupil following head injury. In 1927 the man had sustained a fracture of the base of the right superior maxilla and of the right mandible. When seen by the exhibitor he had a bilateral Argyll Robertson pupil, and this persisted for a number of weeks, after which the right eye recovered and reacted directly and consensually, though the left eye failed to do so. Wassermann was negative. There was some slight atrophy of the right disc.

Classification of fundus pictures of choroiditis

Mr. Malcolm L. Hepburn first referred to his paper on the subject read five years ago and said he was now approaching the subject from a different angle. Before the days of ophthalmic pathology, all fundus diseases were described in terms of the picture presented by ophthalmoscopic examination; hence there was an infinite variety of names given by those who claimed to have discovered new clinical entities, merely because similar pathological conditions had produced some variation in the picture, due largely to the degree of severity and extent of the pathological processes, so that in the various textbooks on ophthalmology there were many different classifications. The term "retinitis" and "choroiditis" had been exchanged, or combined indiscriminately, with but little consideration of where the pathological processes first started. His object in this paper was to indicate a direction in which methods of description might be revised. Pathological investigations of the last thirty years had now reached a point where it was justifiable to build on them a sound classification of fundus diseases.

In order to focus attention on the choroid, he indicated the chief differences between retinal and choroidal pictures. The chief difference was that in choroidal diseases there was always some proliferation or migration of pigment at the final stage of the pathological reaction, while in retinal conditions development of pigment at any time was very rare. The amount of pigment visible in the picture depended on the patency of the various channels through which the pigment could pass. If the normal structures were but little interfered with—as in primary pigmentary degeneration of the retina—the passage of the pigment was not restricted as to its choice of channels, and so it was widely distributed in the affected area. But when there occurred a large development of cicatricial tissues, many of the ordinary channels were crushed out of existence, and in consequence the pigment was hin-

dered in its progress and appeared only at the margin of the scar or in irregular patches in the neighborhood.

In regard to the choroid, the first group he recognized was the inflammatory. In this there was a complaint of sudden failure of sight, though not complete loss, and examination disclosed some vitreous opacities, keratitis punctata, and in the fundus a yellowish-white, slightly raised, edematous patch, round or oval, and with an ill defined edge. It was the number of metastatic deposits, position, size, depth in the choroidal stroma, or degree of severity, which made the differences of picture. Only in regard to this class, he contended, should the term "choroiditis" be used (i.e., an inflammation of the choroid).

His second group was of cases due to disease or obstruction of the choroidal blood vessels, and he called them the vascular type. The signs and symptoms might occur suddenly, or slowly and gradually. Ophthalmic appearances and clinical history were similar to those in the vessel or vessels involved. There was usually little vitreous opacity, and no keratitis punctata. There was some outlying exudate, to which the name retinitis circinata had been applied. The condition under this name had often been described as a separate disease, but, he contended, unjustifiably.

There was one disease, occurring at the macula, which it could be claimed was a special entity, namely, the Tay-Sachs disease (or amaurotic family idiocy); but, except for the fact that it was peculiar to a special type of individual, it was locally a purely retinal affection, the degeneration beginning in the ganglion cell layer.

The only way to prove the existence of retinal degeneration secondary to any choroidal affection was by noting the effect on central vision, or by looking for scotomata in the various parts of the visual field corresponding to the areas involved, as it was not possible to ascertain ophthalmoscopically the condition of the neuroepithelial and other layers of the retina.

Another variety in the vascular group was secondary pigmentary degeneration of the retina due to interference with the blood supply through the medium-sized vessels. In these cases the pigment was deposited on a greyish looking fundus, owing to the development of fibrous tissue in the stroma of the choroid. These cases should, he considered, be described as retinitis pigmentosa, this term being applicable to the primary condition alone.

The greatest amount of confusion, however, surrounded the interpretation of pictures of scars the results of acute conditions which had passed the initial stages without having attracted the patient's particular attention; or of slowly progressive defects which had advanced to a stage where they demanded attention. Some were revealed in a routine examination of the eye.

He agreed there were many borderline types of picture which admitted of either an inflammatory or a vascular interpretation, but an attempt should be made to arrive at a definite conclusion. He submitted the view that those which did present difficulty in diagnosis were those most likely to be associated with failure of development or due to intrauterine inflammation.

The practical clinical outcome of this contribution was that with a view to treating cases successfully it was of the first importance to be able to determine whether an acute inflammatory condition was being dealt with, or one which consisted primarily of a defect in the vascular system.

The next group was of hyaline, calcareous and other degenerations. Hyaline degenerations of the membrane of Bruch were generally seen as small round yellowish patches bordered by narrow margins of pigment. They might occur in any part of the fundus, were often very widespread and were sometimes of irregular shape. The

commonest situation, however, was round about the disc and the macula. He had frequently seen these patches in quite young people. Visual acuity was seldom affected in the regions where they occurred.

His next group was the congenital. Of these he showed a number of pictures on the epidiascope. In addition the group comprised the colobomata, to which he had referred in detail in a paper five years ago.

The fifth group, that of new growths, obviously had to do with a special pathological entity. A further group was concussion injuries and ruptures of the choroid, and these also he was prepared to accept as a separate entity.

He felt that some effort should be made, if need be, by a special committee, to regularize the description of fundus pictures, especially in relation to diseases of the choroid.

The paper was supported by a wealth of drawings shown on the screen. It was not discussed, but the president expressed the hope that some of the points made by the reader would find their way into the textbooks.

Juvenile glaucoma

MR. M. S. MAYOU said this term was applied to glaucoma occurring between fifteen and forty years of age. Mr. A. Hugh Thompson, one of the first observers of it in England, had published five cases of it in the Ophthalmic Review in 1909, and had pointed out that it was a chronic form of glaucoma with exacerbations, the latter not being congestive. Most of the cases presented themselves when one eye had gone blind or nearly so. In nearly all the recorded cases the anterior chamber was deeper than normal, and in some of the cases congenital remains were present in the other eye.

There was much difference of opinion as to whether these cases belonged to the congenital group or were early manifestations of the senile form. As the anterior chamber was deep and these patients had other congenital manifestations, he thought the condition was congenital in origin. The fields of published cases had not been recorded, but this was most important, not only from the etiological standpoint, but also from that of treatment. In two cases which had come under his observation, the fields were contracted and there were scotomata in them, apart from the enlargement of the blind spot. In both cases, also, there were scotomata close to the fixation point, accounting for loss of central vision in one eye of each patient, while the central vision of the other eye was seriously impaired. Mr. Mayou gave particulars of the cases.

He had examined two cases of buphthalmos on which he had operated in childhood, and the patients now had good vision, without any scotomata in their fields. Similarly in the senile form, apart from the scotomata associated with the blind spot, he thought it rare to find isolated scotomata elsewhere in the fields of vision. Possibly these scotomata might be due to pressure on the nerve fibers passing over the edge of the disc by some anatomical distribution of the retinal vessels. The great importance of this scotoma clinically was that, as a rule, patients presented themselves when one eye had gone and the second eye was beginning to show signs of the scotoma in the macula region, before the peripheral field of the blind spot became affected.

Operations for the relief of tension seemed to be universally successful.

(Reported by H. Dickinson.)

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on Ophthalmology

January 17, 1929

DR. C. E. G. SHANNON, chairman

Bilateral retinal detachment in eclampsia, with complete reattachment

DR. W. E. FRY (by invitation) reviewed the literature on this subject and reported two cases which had oc-

curred on the maternity service of the University hospital during a period of twenty-five months. During this time there were 1,024 deliveries. Among these there were 173 cases of late toxemia, an incidence of 16.9 per cent; and these included 19 cases of eclampsia, an incidence of 10.9 per cent. This gave an incidence of 1.2 per cent for retinal detachment among the cases of late toxemia and 10.4 per cent among the cases of eclampsia.

The first case was in a colored woman aged thirty-six years, admitted while in coma. There was bilateral retinal detachment, which extended forward twelve diopters in each eye. There were numerous exudates and hemorrhages. Complete reattachment occurred in three months; the vision was 6/9 in each eye and the visual field showed slight concentric contraction. The second case was in a colored woman aged twenty years. There was marked edema of both lids, and chemosis. The retinal detachment was bilateral and extended forward twelve diopters. There were no exudates or hemorrhages. The detachment was still present twelve days later. The patient was not seen again for six months, when complete reattachment had taken place. The vision was 6/15 in the right and 6/9 in the left eye. The visual field showed a contraction above in the right eye but was normal in the left eye.

Discussion. DR. WILLIAM ZENTMAYER said that as he understood the Leber theory the fibrous tissue had its origin from the ciliary processes and coursed parallel to the plane of the retina. If the detachment was due to such new-formed tissue it was difficult to explain the reattachment. So far as the difficulty of explaining the possibility of the vitreous being dislocated by the elevated retina—except on the supposition of a hole in the retina—was concerned, it was to be recalled that we met with solid detachment of the retina, which must give a similar condensation of the vitreous without tears in the retina.

DR. FRANCIS HEED ADLER asked Dr. Fry if any holes were found in the detached retinas, and further whether the tension was elevated immediately after the retinas had been detached. Lister had pointed out the differences in prognosis between detachments with holes and those without holes, the latter being much more favorable, as would be expected.

Of the numerous theories of retinal detachment the two most popular were the exudation theory and Leber's retraction theory. It would seem evident that these cases could be explained by the exudation theory, and the absence of holes would tend to support this view, since the production of a detachment by means of bands in the vitreous would almost necessitate the presence of tears which would allow fluid in the vitreous to come between the rod and cone layer and the pigment epithelium. One of the objections which had always been raised against the exudation theory was the supposition that one could not have such a detachment without either a rapid removal of fluid from the vitreous or a considerable rise of tension. In these cases, which seemed definitely due to exudation, if no rise of tension occurred it would prove that the argument was unsound.

Infection with streptococcus hemolyticus

DR. MAXWELL LANGDON reported two cases. The first was that of Dr. A. J.B., who had got hot cigarette ashes in his left eye on December 21, 1926. The following day a patient sneezed in his face. By noon the eye was congested and watery, with some swelling of the bulbar conjunctiva. The eye grew worse in spite of treatment, the conjunctiva becoming very edematous, with a thin watery secretion. Cultures were taken from the conjunctiva and blood. The former showed streptococcus hemolyticus in pure culture and the latter were negative. The eye was quiet on January 17, but one week later there was a recurrence, this attack being slight and lasting for about five days. At no

time was there any purulent secretion, the streptococcus hemolyticus not being a pus-producing organism. The eye made a complete recovery.

The second case was that of R.M., aged sixty years, who was admitted to the Presbyterian hospital on December 7, 1928. He gave a history of having been struck in his left eye the previous day by a piece of stone. His left eye showed a rupture of the cornea, the iris not prolapsed but the anterior chamber shallow and the lens hazy. The temperature was 100 degrees. The following day the cornea was completely hazy. The temperature was normal. X-ray was negative for foreign body. The eye did not improve and an enucleation was done on December 14. That night there was considerable bleeding from the socket, and at noon the following day the temperature was 102 degrees. The stump was the site of a white, well organized tough fibrous exudate, but otherwise looked normal. On the third day after operation the temperature was 103 degrees and the exudate had increased. The patient died in the evening of the fourth day. Postmortem examination revealed a left sphenoiditis from which a pure culture of streptococcus hemolyticus was obtained. Cultures from the orbit and blood showed the same organism in pure culture. There was also a generalized meningitis on the left side, and phlebitis of the left cavernous sinus. The sphenoid was probably the starting point of the infectious process. The speaker thought the final result would not have been different if an evisceration instead of an enucleation had been done, because the cerebral involvement must have been present longer than two days and therefore the operation had not affected the outcome.

A new visual test card

DR. ALFRED COWAN showed a test card arranged with letters previously described in the American Journal of Ophthalmology, August, 1928, p. 625. (See also April, 1929, page 301.)

The letters were widely spaced so that each might stand out as an individual test object, in order to eliminate fatigue as much as possible. The graduation followed very closely the geometric progression proposed by Green, but the distances were so chosen that the Snellen fraction might be written in round numbers.

Discussion. DR. ZENTMAYER said Dr. Cowan had given us a test chart based entirely on scientific principles, which made it ideal for recording visual acuity. However, we used test cards in our offices not only for recording visual acuity but for the purpose of subjectively determining the refractive error, so that a test card constructed of letters which did not conform to a scientific basis for determining visual acuity was particularly suited for determination of astigmatism. To resolve such letters as "K" and "X" required that the astigmatism be very accurately corrected, and such letters served for deciding on the strength and axis of the cylinder, yet no worse letters could be constructed for estimating the visual acuity, because a one minute visual angle was lost as we approached the angles of these letters. It had always seemed to him that Landolt's optotype served well for estimating the visual acuity.

Dr. Cowan said that while this card was primarily designed as a step toward standardization of test cards for the notation of visual acuity, the letters offered excellent objects for subjective refraction. At the limit of visual acuity the letters were extremely sensitive, even a slight tilting of the card making a noticeable difference in legibility. The Landolt "C" did not conform to the physiological requirements of a visual test object. In this the patient was required only to locate the opening and therefore, after a certain time, it became photometric and not a visual acuity test. The value of the visual acuity would always be too great with a test of this kind.

Panophthalmitis complicated by pansinusitis

DR. SYDNEY L. OLSHO (by invitation) presented the case of Miss C.J., aged sixty-seven years, who was first seen at the Jefferson hospital on September 28, 1927, complaining of poor vision. The right eye showed a leucoma of the cornea, the eye being quiet and the tension normal. The left eye showed numerous nebulæ of the cornea, vitreous opacities, and wide-spread myopic choroiditis. She disappeared to again reappear on December 11, 1928, giving a history of a painful and inflamed right eye for eight days. The lids were red and swollen, with ecchymosis of the conjunctiva. The globe was proptosed forward, downward, and outward and was immobile. The x-ray showed clouding of all sinuses and the rhinologist reported pansinusitis. A diagnosis of panophthalmitis was made. An evisceration was performed, following which the pains subsided and there was prompt and progressive disappearance of edema and inflammation. Because of the rapid improvement after evisceration, he thought the panophthalmitis was caused by a perforating corneal ulcer and was in no way due to an extension from the sinuses.

Discussion. DR. ZENTMAYER said the question of the relative safety of enucleation and evisceration in panophthalmitis had been discussed for years. About twenty years ago Dr. Randolph did some animal experimentation hoping to reach a conclusion. Dr. Zentmayer's recollection was that the results were unsatisfactory. Although they leaned toward enucleation being a safe procedure Dr. Randolph decided that personally he was not convinced, and preferred to treat the condition as he would an abscess.

DR. LANGDON questioned whether the result in his case (see above) would have been different had he performed evisceration. The literature showed that meningitis was fully as frequent after the one as the other. Personally he believed that there were other factors which determined the occurrence of meningitis in these cases. If there was not much orbital cellulitis he preferred to do an enucleation. Where there was marked proptosis and swelling of the lids he did an evisceration.

A daylight unit for perimeters: screen for perimetry

DR. OLSHO also showed a light unit that could be attached to the cylindrical weight of a McHardy perimeter. It employed the same center of rotation as the perimeter arm and gave an even distribution of a daylight quality of light.

DR. OLSHO also showed a screen for perimetry. The screen consisted of four hinged panels six feet high and painted a neutral gray. This screen was especially valuable in an eye clinic, as it served to isolate the patients, to exclude more or less from view objects distracting the attenion, and provided a neutral background. It might be folded up flat or used as a cabinet to protect the perimeter.

Discussion. DR. H. MAXWELL LANGDON said that it struck him that the concentration of the light in one rather bright area on the arm of the perimeter was not very desirable if the field was taken in a room which was not generally well illuminated, as under such circumstances the retina would adapt itself for a low illumination but be called on to do its work in a very brightly illuminated field.

Superficial necrosis of corneas

DR. BURTON CHANCE related the case history reported in full on page 303 of the April, 1929, issue of this journal.

A. G. FEWELL,
Clerk.

KANSAS CITY EYE, EAR, NOSE, AND THROAT SOCIETY

January 17, 1929

DR. BLAKESLEY presiding

Comparative frequency of various eye diseases in America and Europe

DR. PETER C. KRONFELD stated that he was quite surprised at the import-

ance of refraction in the practice of ophthalmology in the United States. While it was true that the various forms of ametropia existed in Europe in about the same proportions as here, yet the patients did not seem to suffer from strain, glare, and headache as they did here, consequently they did not seek aid from the ophthalmologist unless the defect of vision interfered with their occupational pursuits.

He attributed this difference to the difference in mode of living, and the high tension and nervous strain under which the average Amercian worked. An accurate comparison of the varying degrees of ametropia could, however, be gained only through comparison of accurate statistics, both of clinical and private cases, from both sides of the Atlantic.

He here called attention to the comparative statistics of Dr. Tiffany of Kansas City in 1887 and his own of more recent date, from European practice, in which there was very little average difference in astigmatic or spherical errors.

In regard to myopia, especially of the higher type (—13.00 D. or more) Dr. Kronfeld stated that it was more prevalent in Europe than here. Almost five per cent of the cases from the first eye clinic of Vienna were of this type. On recent investigation in Germany, where the theories of school myopia originated, there had been some change of opinion as to etiology and course. This condition and the degree of its progress were now thought to be fixed by hereditary factors, rather than by misuse of the eyes, and were not considered to be retarded by refractive treatment.

Concerning the infections of the uveal tract, Dr. Kronfeld recognized the fact that tuberculosis played a less important rôle here than in Europe. However, he thought that a happy medium should be struck, as we laid too much stress on focal infection, and the Europeans too much on tuberculosis. He gave some very interesting experimental observations in which the blood and aqueous of these patients had been injected into animals, producing typical tuberculous lesions, verified at autopsy.

Skiascopy with cylinders

Dr. Edwin N. Robertson demonstrated the practical side of skiascopy, using for illustration a specific case of mixed astigmatism (—2.50 sph. + 4.00 cyl. ax 85°) and gave, with appropriate illustrations, a detailed explanation of the changing optical phenomena produced by placing before the examined eye the indicated sphere and cylinders.

The effects of the too low, too high, and correct cylinders, off and on the proper axis, were demonstrated. Emphasis was laid on two points: (1) that by this method of skiascopy with cylinders the amount of the patient's astigmatism could be determined to within a quarter of a diopter with reflected light and many times to within one-eighth of a diopter with the electric retinoscope; and (2) always the exact axis. This could never be accomplished by the old method of skiascopy using only spheres.

Previous articles on cylinder retinoscopy had described what happened when a cylinder that was too weak, too strong, or correct as to strength was placed before an eye in an attempt to neutralize the astigmatism of the eye. When the cylinder was correct as to strength but off axis a new spherocylindrical combination was created by the crossing of the cylinder defect of the eye with the one placed before the eye. When the correct plus cylinder was placed too far to the right of the correct axis, a new hyperopic or "with" movement was seen to the left of the axis of the inserted cylinder. The new movements of light thus produced were not always perceptible as bands. Only, for instance, when the new mixed astigmatism amounted to about two diopters were distinct band-like effects to be recognized.

As a further aid to the recognition of the correct cylinder, emphasis was

laid on the fact that when the cylindrical defect of the eye was crossed by an inserted cylinder of the same strength, but a little off axis, an equally mixed astigmatism was produced, that is, the more strongly refracting meridian would be just as much myopic as the weaker refracting meridian would be hyperopic. This strength of cylinder was not sufficient to produce a band of light, but, because of the equal strength, the against movement in one meridian would be of the same brightness and rapidity as the hyperopic movement at right angles to it. The nearer the correcting cylinder was to the correct axis the less was the strength of the mixed astigmatism produced. When the correct cylinder was farther away from the correct axis a mixed astigmatism of greater strength was produced, and might result in the appearance of a distinct hyperopic band of the same brightness and rate of movement as the myopic band at right angles to it. When these equally clear movements or bands moving with the same rapidity existed, the cylinder was correct as to strength and all that remained to do when working with a plus cylinder was to keep turning the cylinder toward the hyperopic movement or band until all movement stopped at the proper skiascopic distance.

Furthermore, as the new movements or bands became more distinct due to the inserted cylinder being too far to right or left of the correct axis, the so-called angle of direction between the axis of the inserted cylinder and the new hyperopic band became greater. With the correct cylinder off axis thirty degrees, the angle of direction would be sixty degrees. Much could be learned from the appearance and speed of the two opposite light movements. For example, in the case of the excessively strong cylinder the angle of direction rapidly increased with incorrect axis, and in many cases there was to be seen a very clear myopic band moving slowly in one meridian and a less clear but more rapid hyperopic movement (not even the suggestion of a band) in the meridian at right angles; and vice versa in the case of the weak cylinder.

MORRIS H. CLARK,
Reporter.

COLORADO OPHTHALMOLOGICAL SOCIETY

January 19, 1929

DR. JEAN GALE presiding

Traumatic chorioretinitis

DR. WILLIAM C. BANE showed H.M., a machinist aged twenty-two years. In the evening of December 18, 1928, a hot metal shaving about an inch in diameter had struck the left eye. It produced a skin wound through the lower canaliculus downward and outward for three-fourths of an inch, also a small triangular cut near the margin of the left cornea in the lower nasal quadrant, and a superficial cut in the conjunctiva, downward and inward from the corneal wound. The corneal cut did not enter the anterior chamber. The x-ray was negative. The vision of the right eye was 5/6, and of the left eye fingers at eighteen inches. There was a manifest edematous disturbance of the retina in the lower nasal quadrant of the fundus, and the vitreous was slightly hazy.

On December 22, the vitreous was still hazy, permitting only an indistinct view of the fundus. Vision was 5/60. On December 28, much of the retinal edema had disappeared and some small pigment deposits were seen in the retina in the macular area and below the optic nerve. Vision still was 5/60. By January 29, the vitreous was quite clear and the optic nerve appeared normal. The pigment deposits were seen over an increased area, and were more sharply defined than when first noticed. The vision was still 5/60, not improved by lenses.

Discussion. DR. EDWARD JACKSON thought that the fundus changes resembled those which had been seen

during the war and ascribed to concussion.

DR. BANE, in closing, pointed out that in Ball's "Modern ophthalmology" this condition was described under "traumatic retinitis," and also that McKee had collected and analyzed twenty-eight cases.

Intraocular foreign body

DR. JAMES M. SHIELDS brought F.G., aged thirty years. While hammering on a tank November 20, 1928, something struck his left eye. He was seen immediately. About four millimeters to the temporal side of the limbus of the left eye was a vertical incised wound through which a piece of steel had passed into the vitreous. The foreign body was localized by x-ray and removed by hand magnet through the wound of entrance without any difficulty. The tip of the magnet was introduced barely into the lips of the scleral wound. The scleral wound was closed by a single suture, and a conjunctival flap was brought over it. Atropin was instilled and the eye covered. The patient was sent to the hospital and kept in bed for one week. He was given three injections of foreign protein to combat infection. The eye had quieted rapidly and completely with no sign of infection, but it had since shown complete detachment of the retina with loss of vision except for barest light perception in the extreme temporal field.

Discussion. DR. WILLIAM H. CRISP felt that there had probably been a great deal of hemorrhage at the time of the injury, and then an early detachment of the retina which was masked by the hemorrhage. The size of the piece of steel was relatively quite large and the contusional effect must have been great, due to its size and speed.

Traumatic cataract

DR. EDWARD R. NEEPER showed F.C., aged thirty-six years, whose lens had become uniformly cataractous six days after an injury. The question of the possibility of formation of cataract in such a brief period, and also compensation, was to be considered.

Discussion. DR. MELVILLE BLACK raised the question of the responsibility of the employer for having a record of the vision of all employees before and during employment. If no record was available the patient's word had to be accepted in regard to his vision.

DR. EDWARD JACKSON and DR. WILLIAM H. CRISP thought that the lens opacity was not due to contusion. This idea would be strengthened if no progression occurred. The eye must be considered as having had some previously existing pathology.

Basal cell epithelioma (two cases)

Patients illustrating this condition were shown by DR. RALPH W. DANIELSON (by invitation) and DR. WILLIAM H. CRISP.

DR. DANIELSON showed a woman, aged forty-eight years, who had come to the University of Colorado clinic on August 23, 1928. On examination a firm lobular mass was seen in the region of the upper canaliculus of the left eye. Two or three yellowish areas seen through the red surface of the tumor mass suggested leptothrix. On September 6, 1928, the tumor was incised, but the mass was found more solid and less cystic than previously suspected.

On September 7, the tumor was removed and frozen sections showed a basal cell epithelioma. Treatment with fifteen milligrams of radium was given (on September 16) by direct contact, unscreened, for one hour. This was repeated on October 15, except that the wound was protected by a rubber dam. The course of healing had been uneventful except for the redness and swelling subsequent to each radium application. There was no evidence of recurrence or metastasis.

DR. CRISP again showed the man who had been brought before the meeting of the society on March 17, 1928, on account of a basal cell epithelioma of the lower eyelid. The case was shown

to illustrate the late results of radium in these cases.

The tumor had appeared clinically as a ring-shaped hard mass with a deeply depressed center which was intermittently covered by a crust formed from the discharges. The tumor had been exposed to twenty milligram-hours of radium with lead protection for the eyeball and adjacent tissues. Microscopic study of excised tissue had shown a basal cell epithelioma with almost no mitoses.

At the present showing of the patient, the former position of the tumor was represented by a scarcely noticeable scar, level with the surrounding parts. The eyelashes in the corresponding part of the eyelid had been permanently lost, and there was a slight chronic congestion of the bulbar conjunctiva in this direction. It was noteworthy that the shrinking of the tumor and flattening of the resulting scar had gone on for at least two months after the single exposure to radium. The question therefore arose whether a mistake was not frequently made in giving several doses of radium at short intervals.

Discussion. Dr. William T. Brinton observed that in the first case reported surgery was resorted to before the application of radium. In the second case radium alone was used. He believed that radium alone was sufficient.

Renal retinitis

Dr. Donald H. O'Rourke presented Miss E.F., aged forty years, whose fundi showed the typical picture of arteriosclerosis and renal retinitis. The patient had a chronic interstitial nephritis.

Lymphangioma of the conjunctiva

Dr. William C. Finnoff exhibited L.L., male aged twelve years. About nine years ago there was noticed a slight swelling of the conjunctiva of each eye. The condition had gradually progressed and at the present time the whole bulbar conjunctiva of the right eye below the level of the upper margin of the cornea showed a marked edematous swelling that was due to engorgement of enlarged lymph vessels. The tortuous and dilated lymph vessels could readily be seen with the corneal microscope and with the naked eye. A similar condition was present in the left eye, but was not so advanced. The vision was unaffected.

Discussion. Dr. E. M. Marbourg suggested the use of the actual cautery.

Quiescent tuberculous keratitis and iritis: thermophore

Dr. William T. Brinton brought Mrs. S., aged thirty-one years. She gave no previous history of any tuberculosis preceding the present eye condition. Nine years ago she had a septic infection at childbirth, followed by many months of marked debility. Seven years ago an iritis developed in the left eye, and two or three months afterward the same condition developed in the right eye. The corneæ were not involved until several months afterward, when the left became very opaque and soon afterward the right was also involved.

There were periods of two or three months when the inflammatory condition disappeared, only to be followed by a period of exacerbation. Two years ago the corneal opacity reached its maximum, and at that time the patient could just distinguish the turning on of electric lights. Eighteen months ago, at the height of one of these inflammatory periods, daily treatments with the thermophore were instituted and in the course of two or three weeks all inflammation had subsided. There had been no recurrence since that time. The thermophore had been used quite frequently in an effort to further clear the corneal opacities. The vision had improved in the right eye so that the patient was now able to see the larger headlines and to do her housework. The slit-lamp showed in the left eye a marked vascular interstitial keratitis with posterior synechiæ and pupillary

exudates, and in the right eye a less dense vascular interstitial condition with a rather dense calcareous opacity directly in front of the pupil. This seriously interfered with vision. There were also a few posterior synechiæ but the anterior capsule was fairly clear.

DONALD H. O'ROURKE,
Secretary

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

February 12, 1929

DR. C. K. LEWIS presiding

Retrobulbar neuritis

DRS. J. B. STANFORD and JOHN J. SHEA presented the case of E.L., aged thirteen years, who when first seen on January 12 had had sudden loss of vision as a complication of an acute head cold. Examination of the eyes by Dr. Stanford showed right vision 20/20, left 10/200. The superior nasal quadrant of the left field was blind. Examination of the nose showed a purulent discharge coming from the posterior sinuses. Lipiodol failed to enter the sphenoidal sinuses. The tonsils were of moderate size, but had been frequently infected. The roentgenogram showed a bilateral pansinusitis.

The sphenoids were opened with a Sluder knife. The ethmosphenoidal wall was broken down for drainage of the posterior ethmoidal cells. There was greater difficulty entering the left sphenoid than the right due to the thickness of the anterior wall on the left side. The anterior ethmoidal cells were not entered. The antra were drained by insertion of a number fourteen catheter. The tonsils and adenoids were removed.

The girl stated that within a few hours after operation her vision was clearer, and by morning the improvement was nearly to normal. Examination of the left eye by Dr. Stanford on January 21 showed vision of 20/20, with normal fields. No fundus changes were apparent at either examination.

Discussion. DR. P. M. LEWIS thought the fields atypical. Most retrobulbar neuritis cases he had seen had good peripheral fields with a central scotoma.

DR. E. C. ELLETT, during the past twenty years, had seen many such cases operated on for manifest nasal disease, with recovery. However, he thought the swing was now toward the teeth and tonsils as possible factors in this affection, and he quoted Dr. Leon White, a former advocate of intranasal surgery in this condition. The recovery was not necessarily due to the sinus surgery, as many recovered when nothing was done. One should be on guard, as many other things could cause retrobulbar neuritis, and he thought the principal indication in such ocular disease was a thorough general examination at first. Some of our rhinological colleagues seemed to be anxious to operate on sinuses, but he thought this might be due in part to the fact that it was almost impossible to obtain a report of normal sinuses from the roentgenologist.

DR. J. B. STANFORD thought it difficult to tell just what caused the trouble. He had thought of hysteria, but the child had not seemed of that type. He had seen cases which recovered by sinus surgery alone, but had never seen a case of retrobulbar neuritis which recovered by tonsillectomy only.

Glass in anterior chamber

DR. E. C. ELLETT reported the case of J.C., aged fifteen years, who on January 7, 1928, had put a glass test tube on the end of a rifle and fired a blank cartridge. The test tube was broken and a piece struck him in the left eye. He was seen five days later with a wound of the cornea running from the center to seven o'clock position. There was a traumatic cataract with considerable swelling of the lens, but no foreign body could be seen and the x-ray was negative. A

simple linear extraction was done on January 14, from which he made a prompt recovery and went home on the seventeenth. The sight in this eye was moving objects. On December 31, 1928, he returned, saying that the left eye had been red and irritable for a week. The vision was perception of light in the lower part of the field. The eye was slightly inflamed and the tension was 60 mm. Lying on the base of the iris at the six o'clock position was a piece of glass about one by two millimeters. A keratome incision was made at the limbus below it and the piece of glass removed with forceps. On January 7, the eye was quiet and tension was 37 mm. No iridectomy was done, because an iridectomy in this situation would have caused a considerable disfigurement, the vision was practically lost anyhow, and it was doubtful if an iridectomy would have helped matters so far as the tension was concerned. The foreign body was shown.

Discussion. DR. P. M. LEWIS thought this an example of how difficult it was to perceive glass in the eye. He remembered a case in which a fragment of glass on the cornea had evaded close observation daily for a period of two weeks.

Metallic foreign body in the eye for twenty years

DR. E. C. ELLETT described the case of Mr. E.C., aged forty-eight years, seen on January 26, 1929, with the following history: About nineteen years ago the right eye was injured by a piece of steel and subsequently shrank. No enucleation was done and there remained in the orbit a small hard white mass representing the eyeball. He wore an artificial eye over this stump and had no trouble referable to it.

About a year before the right eye was lost he was struck in the left eye with a piece of steel and had a magnet operation performed, at which the steel was said to have been removed, though it was never shown to the patient. The eye had been serviceable since then until about three months before he came in, when he began to have spells of inflammation in it. His tonsils were removed, and during subsequent attacks he had several bad teeth removed. His general physical examination, Wassermann, and so on were all negative. The eye showed signs of a mild iritis, and there was a dark mass lying in the angle of the anterior chamber between the two and three o'clock positions. This was easily visible and had the appearance of a piece of rusty metal. Most of the body was rust color, but the lower extremity was black. A keratome incision was made just below this point and was enlarged upward with scissors. A large magnet applied over the cornea did not have any effect on the foreign body, but when the point was introduced between the lips of the wound a particle of metal about 1.5 mm. in diameter was removed. A little mass of dark substance was left on the iris, and after two attempts to grasp it with forceps it was decided to do nothing further but to close the eye. The eye recovered without any trouble and the patient went home in five days. The vision with the left eye at that time was 20/20 partly with glasses. The foreign body was shown.

Concretion in the canaliculus

DR. E. C. ELLETT discussed the case of Mrs. M., aged fifty-seven years, who had been under observation for about fifteen years, usually with reference to her glasses. In February, 1928, she complained that the left eye watered and hurt a little. Nothing was seen at this time except a little conjunctivitis in the left eye, for which a wash was given. In November, 1928, she returned complaining that the left eye watered almost constantly, and that that morning she had noticed a little blood come from it. The region of the left lower punctum was swollen and on pressure a little pus, and later a little

blood, came from the lower punctum. Water passed freely through to the nose, and a small probe did not encounter any obstruction. Several irrigations were done without any effect, and the condition remained just the same. On account of the inability to feel any foreign body it was thought she had some sort of inflammatory trouble in the tear passage, possibly a growth. With this idea in mind, she was given several x-ray treatments, but without effect. On January 23 it was decided to explore the canaliculus for a possible foreign body, and when the canaliculus was slit a small yellow mass immediately presented and was removed. The inflammatory symptoms subsided. The mass was oval in shape, about 2/16 by 1/16 of an inch in size and semisolid, and composed of cellular débris and bacteria. These bacteria were principally saprophytic, but there were occasional staphylococci, streptococci, and organisms of the diphtheroid group. Smears for yeast and fungi were negative. The specimen was shown.

Discussion. Dr. R. O. Rychener had seen such a concretion of the size of a pea in an upper lacrimal duct, composed of a waxy substance from which streptothrix forsteri was cultured.

BB shot in orbit

Dr. D. H. Anthony reported the case of A.G., a boy aged ten years, who while playing with another boy was accidentally shot in the left eye by a BB air rifle, and immediately noticed slight bleeding from the left lower lid. Examination showed a small abrasion of the left lower lid about five millimeters from the margin on the temporal side, with a small laceration of the left lower cul-de-sac just behind the abrasion of the lid. X-ray localization showed a shadow apparently of metallic nature within the left orbit, 20 mm. behind the cornea, 12 mm. below the center, and 8 mm. to the temporal side.

The left eye was cocainized and one per cent novocain injected deep into the orbit, down and out in the region of the BB shot. A small incision was made in the left lower cul-de-sac and a long curved hemostat was inserted in the orbital fat in the direction of the BB shot, opened and then withdrawn partly open. The BB shot floated up between the jaws of the hemostat, presented under the conjunctival wound, and was removed with a pair of forceps. The incision was not closed with sutures.

Discussion. Dr. M. G. Seligstein had seen last month a case in which a BB shot did not penetrate, but struck the margin of the lid. There was hemorrhage into the anterior chamber, iridodialysis, and vision reduced to 20/200 which did not improve. The x-ray was negative.

R. O. Rychener,
Secretary.

CHICAGO OPHTHALMOLOGICAL SOCIETY

February 18, 1929

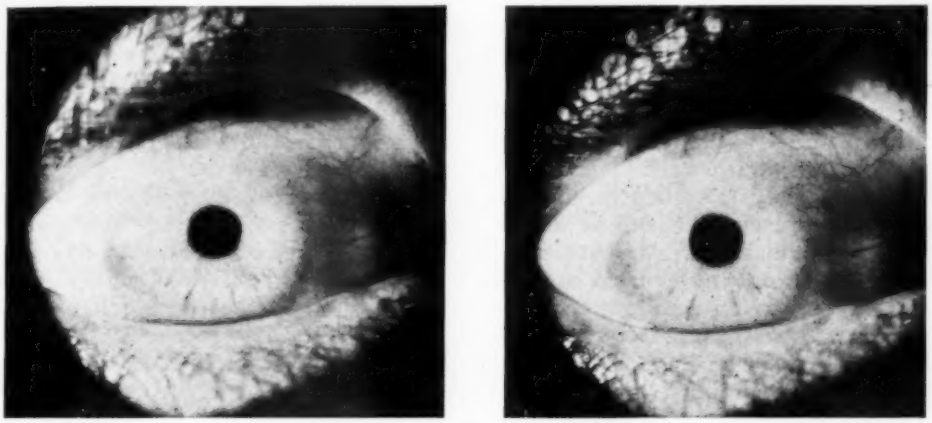
Dr. George F. Suker, president

Embryotoxon

Dr. C. O. Schneider showed Mr. W. A., aged twenty years, who presented a rare congenital anomaly. Both corneæ were small, about 9.5 mm. in diameter. Vision of the left eye with correction was 20/20; right eye 20/60; which could be improved only with a pinhole disc because of the irregularity of the cornea. There was also present another anomaly, probably representing an arrested development of the extrinsic musculature. The right eye deviated outward and could not be turned in beyond the median line; there was also limitation of movement in some of the other directions.

Both corneæ presented an embryotoxon, a grayish vascularized clouding extending inward from the limbus, above and below. The condition had been described by Axenfeld as follows: Some such cloudings remained stationary, while others changed after

birth. Embryotoxon presents a delicate grayish clouding of the corneal border, the normal sharp differentiation between cornea and sclera being absent. The clouding was due to an abnormally wide extension of episcleral tissue on to the cornea, and was often seen in conjunction with extreme enlargement of the cornea.



Embryotoxon, Schneider's case, stereoscopic photograph by R. Von der Heydt. (Stereoscopic use of these two photographs is absolutely necessary for satisfactory visualization of the unusual condition illustrated.)

According to Peters, the localization above and below made it possible that pressure of the eyelids might be a contributing factor. Peters had proved anatomically that there was a drawing over of the upper scleral layers beyond the limbus. This was not the result of an inflammation as had been supposed.

In the present case corneal development was arrested. Anatomical findings seemed to indicate that the normal differentiation of mesoderm and substantia propria was lacking and that in its place ordinary vascularized connective tissue had developed. Slit-lamp findings plainly showed grayish superficial extension of the vascularized continuation of the conjunctival membrane to be movable on the corneoscleral base. A stereophotograph taken by Dr. Robert Von der Heydt showed the extent, shape, and vascularization of the embryotoxon.

Sympathetic ophthalmia

Dr. Sanford Gifford, of Omaha, (by invitation) reviewed the hypotheses as to the etiology of sympathetic ophthalmia. In his belief the anaphylactic theory involved a complicated sequence of events and could not be said to have been proved. There were many reasons against it and in favor of the theory that some living organism was the cause.

In view of the negative results of frequent examinations for organisms, the possibility of an ultramicroscopic organism being the cause had occurred to Szily and others. Szily had reproduced the picture of sympathetic ophthalmia by inoculating rabbits in the ciliary region with the virus of herpes simplex. Gifford and Lucic had confirmed his results and, by obtaining positive inoculations from the second eye and from the chiasm and nerves, had provided additional evidence that the virus traveled via the chiasm and optic nerves to the other eye. This only proved that such a virus could produce uveitis in the second eye, and no claim was made of proof that herpes virus was the cause of sympathetic ophthalmia. What was necessary for such proof was the result of inoculations from human cases. A number of these had been made by the author and others with negative results. In one case, however, a progressive corneal lesion was produced by such inoculation.

Among early diagnostic signs mentioned were increasing myopia due

to ciliary spasm and slight optic neuritis, occurring with practically no congestion. The advantage of slit-lamp examination in these early cases was emphasized. Two cases of recurrent sympathetic ophthalmia, one having shown four recurrences during nine years and the other three recurrences during four years, were described. In both cases these attacks followed enucleation of the first eye after sympathetic ophthalmia had developed.

In considering prophylaxis, early removal of the eye in dangerous wounds was advocated and, where sympathetic ophthalmia had not begun, simple evisceration presented cosmetic advantages over enucleation. Any prolapsed uveal tissue should be excised and the wound covered with a sliding conjunctival flap, prepared before the prolapse was excised. Two diagnostic procedures which had been proposed as giving early evidence of sympathetic ophthalmia were discussed, namely the differential blood count and the skin test with uveal pigment. Neither had been found consistent enough to give reliable information.

In the treatment of sympathetic ophthalmia, sodium salicylate according to H. Gifford's dosage (one grain per day for every pound of body weight of the patient) was most valuable. Larger doses up to 200 or 250 grains a day were given where the smaller were not producing results. Where vomiting occurred, cincophen or neocincophen could be given in the same dosage. Foreign protein therapy, especially typhoid bacilli intravenously, was of value in certain cases. Foci of infection should be cleared up. The most formidable complication of sympathetic ophthalmia was secondary glaucoma, and if operative interference became necessary it should be as slight as possible, preferably a small peripheral iridotomy.

The results of twenty-seven cases seen by H. Gifford and his associates since his previous report in 1910 were given. Eight obtained vision of 20/20, eight of 20/30, two of 20/50, and the remainder counting fingers to zero. That is, two-thirds obtained vision of 20/50 or better, the remaining one-third being practically blind.

Discussion. Dr. E. V. L. Brown believed in prompt enucleation but regarded the benefit as an unproved assumption with reference to the sympathizing, second eye. In a case which improved after enucleation two other factors probably contributed; the process in the second eye might have been only a mild and self-limited one, and furthermore medical treatments were carried out with unusual care in case of trouble in the other eye. Twenty cases of sympathetic ophthalmia had been studied anatomically during the period of twenty-five years, twelve of them clinically also, and in seven of the twelve enucleation did not exert a favorable effect, and the eventual vision in the second eye was nil, perception of light, or hand movements. Five of the twelve improved after enucleation and four maintained useful vision for four to nineteen years. But all had energetic treatment beside enucleation. His view was that these five cases were mild ones and that enucleation only removed a further depot of infection.

On a number of minor points his experience differed from that of the author of the paper; namely, that optic neuritis was frequent in the second eye, that the disease was more severe in children, and that the infiltration was chiefly confined to the posterior part of the uvea. He would say that it was usually more characteristic and diagnostic in the choroidea than in the ciliary body or iris. Theoretically he agreed that if the disturbed pigment in the primary eye was the cause of the trouble in the secondary eye the complication ought to arise more often from other forms of uveitis which disturbed pigment extensively, such as tubercles and gumma. He agreed with the author that the supposition of the presence of living organisms in each eye, rather than any other noxious agent, best explained the phenomena of the disease.

DR. HARRY GRADLE said that everyone dealing with sympathetic ophthalmia had formed a more or less definite opinion as to clinical course, as to time for possible enucleation, and in many instances as to possible etiological factors. The etiology was interesting. He believed in the Elschnig anaphylactic hypothesis, which was not understood as it should be. Elschnig claimed that with a perforating injury and subsequent traumatic inflammation there was liberated a sudden flood of uveal pigment which was absorbed and sensitized the entire system to that particular pigment. That would involve only tissue containing uveal pigment, namely, the uvea and the labyrinth of the ears. This sensitiveness in itself was not enough to produce a sympathetic condition, but simply lowered the resistance, and the exciting factor was a toxemia such as could result from a focal infection or a disturbance of metabolism. Thus there were two sources; the pigment released suddenly by trauma, and a toxemia from other sources, such as might occur in ordinary toxic uveitis. Sympathetic ophthalmia did not follow iridocyclitis because of the pigment. Where there was a low grade of inflammation the pigment underwent a marked change in form, and as such was not absorbed parenterally. Many cases reported as sympathetic ophthalmia were questionable; undoubtedly a large percentage were merely uveitis due to focal infection in which the source was not recognized; probably a large share of cures reported from foreign proteins and so on were simply due to cleared-up sources of focal infection, after which the eye took care of itself. In a true sympathetic ophthalmia, elimination of secondary sources of infection would not materially influence the course of the disease.

DR. PETER KRONFELD agreed with Dr. Gifford that further information on sympathetic ophthalmia could only be expected through careful bacteriological study. Dr. Gifford had mentioned that combination of tissue culture with culture of bacteria might be successful. That was tried in Vienna. A culture of normal uveal tissue was made, and an effort was made to get a growth by inoculating material taken from eyes with sympathetic ophthalmia. However, the disease was rare, and in the last few years only three cases had been seen. In those three cases the experiment was negative. Dr. Kronfeld suggested that cases of true sympathetic ophthalmia should be turned over to an institution having facilities for doing high grade bacteriology. With regard to Elschnig's hypothesis, there was no doubt that the uveal pigment had an affinity for salicylates, which would account for the good results reported by Dr. Gifford, but that did not prove anything in the way of Elschnig's idea or the bacteriological hypothesis. The evidence for both hypotheses was weak, and a combination of both might be impossible.

DR. SANFORD GIFFORD (closing) said he was not a believer in evisceration in the presence of sympathetic ophthalmia but did advocate the frequent use of evisceration in penetrating wounds before any signs of sympathetic ophthalmia had developed. The evidence in favor of either the anaphylactic hypothesis or the hypothesis of a germ or filterable virus as the cause was still very weak. Many people had accepted the hypothesis of Elschnig because it had been presented so frequently, and it was well to bear in mind the possibility that the germ idea might some day prove to be correct. Apropos of Dr. Gradle's remarks about toxemia and focal infection, although it was difficult to believe that these could be causative factors in sympathetic ophthalmia, foci of infection should be looked for and cleared up where found. Elschnig thought the intestinal tract was usually guilty, and found indican in the urine of most of his patients. The necessity for avoiding intestinal stasis should never be forgotten in these cases. The essayist advocated special care of any eye removed, and urged

that instead of the eyes being completely sacrificed for pathological specimens they should be given to a competent bacteriologist for careful study, especially by animal inoculation.

Complications in cataract extraction

DR. C. W. RUTHERFORD (by invitation) presented the paper on this subject published in this Journal, page 569.

Discussion. DR. HALLARD BEARD said that one phase of the subject was the prolonged iridocyclitis which frequently followed cataract extraction, and which might last for a period varying from a few days to several months. It was perhaps exogenous infection which developed at the time of the operation due to lack of antiseptic precautions. The question of focal infection in this connection was interesting and should be considered, as should also tuberculosis. He was impressed with the frequency of the diagnosis of tuberculosis in Vienna: they did not look for focal infections there: oral sepsis, tonsils, and sinuses were not gone into thoroughly. Cyclitis following cataract extraction had been explained largely on the basis of sensitiveness to lens protein. The reports on lens protein had been inconclusive, however. If it was assumed that reaction against lens protein was responsible for some of these cases, the question of how best to remove the cortical substance from the eye following extraction should be considered. Inquiry during the past six months as to the general opinion with regard to lavage of the anterior chamber had indicated that it was regarded as more of a hazard than an advantage.

DR. G. HENRY MUNDT said that in a patient with a four plus Wassermann he would depend upon whether it was an active lues as to whether operation should be done.

DR. O. B. NUGENT said that since the conjunctival flap was used it was necessary to keep a patient in the hospital only about ten days, whereas it was formerly an affair of at least three weeks. He had noticed in European clinics that deep orbital injections were being done to block the ciliary ganglion. Infiltration behind the eyeball followed. In his experience fifty per cent solution of cocain and adrenalin, as suggested by Vila Coro and Fisher, and Van Lint's method of blocking the seventh nerve, had been found most effective. He believed capsule remnants to be one of the most common causes of postoperative inflammation, and thought it dangerous to leave the capsule when it had become loosened from its attachment.

DR. RUTHERFORD (closing) said in connection with the question of preoperative study and preparation that state cases only were reported, but it was doubtful if any similar group of private patients could be more carefully prepared for operation. Anesthesia by infiltration of the orbital tissues was not practiced except for enucleations. ROBERT VON DER HEYDT.

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THE NEW VISION

Taking "The new vision" for the title of his Bowman lecture last year Professor G. Elliot Smith spoke from his standpoint as a student and teacher of anatomy and comparative anatomy. He called the attention of the Ophthalmological Society of the United Kingdom to the changes of structure and function that have attended the evolution of the macula in the retina, and its cerebral connections through the visual tracts. The facts brought out in the lecture justified his use of the title; but their wide implications and practical applications only appear by associating this new thought with phases of physiology and ophthalmology not considered in that lecture.

Smith points out that the essential difference between "rods" and "cones" in the retina is not in their form but in the nature of their connections. A group of rods transmit their impulses to the same granule of the external granular layer, while each cone is connected with a single granule and a single ganglion cell, and is represented by a single axis cylinder in the optic nerve. The cones in the fovea closely resemble rods in shape, but each has its separate connection with the central nervous system. As a result, in the monkey and in man, more than one-third of the fibers in the optic nerve come from the macula; although this region of the retina has only one-twentieth of the area of the whole retina.

Before the evolution of the macula, and before the appearance of a semidecussation of the optic chasm, each half of the brain was connected only with the eye of the opposite side. The higher evolution of the visual tracts has accompanied the development of wider connections between them and the cortical centers, in the form of that wide cortical area of the brain to which Smith applies the name "neopallium". With this interassociation visual impressions come to have a new and vastly more important share

in cerebral operations, and the human type of mind may be regarded as based on these visual connections. Their basic importance must be thought of as accounting for the wide importance and often dominant psychoneural influence of eye strain.

The chiasmal semidecussation gives each retina, especially its macula and fovea, a wide connection with both cerebral hemispheres; and visual images and visual memories, widely associated in the cerebral cortex with the other impressions, become a most important element in all our thinking. As Smith's Bowman lecture concludes: "The development of macular vision confers upon man the ability to see the world and appreciate its meaning in a way that no other living creature is able to do. His new vision depends upon powers of visual perception as distinctive as the use of articulate speech to give expression to what he sees and thinks".

That "cone" vision differs greatly from "rod" vision has come to be generally understood, from the accumulation of physiologic experiences and from the effects on vision of retinal and cerebral lesions. But it has not been realized how much of our seeing is cone vision. All accurate distinction between small areas of color, all observation of minute objects, that separation of impressions which gives us the great mass of what we learn by sight regarding the external world, belong to cone vision, and to the memories and mental associations built on cone vision. Color vision in the peripheral field should be studied separately, and by different tests and methods from those employed for studying vision in the area of the macula. Our knowledge of rod vision in the periphery of the retina is still rudimentary. Here is a promising field for original research.

Binocular vision, as we know it, is wholly a development of the "new vision" in connection with the macula. Binocular diplopia becomes noticeable and annoying only when it disturbs the exact discrimination of cone vision between separate impressions. This needs to be thought about in all studies of binocular vision, normal or abnormal. It will certainly lead to a better understanding and more effective management of all sorts of disorder of ocular movement, as well as to a fuller understanding of what can or can not be accomplished by fusion training. The "duplicity theory" of vision has been known to find support in the phenomena of light and color perception and adaptation; but anatomic evidence of the importance of the evolutionary changes in the retina and in the connected parts of the central nervous system gives the "duplicity theory" new interest and meaning.

Edward Jackson.

CHRONIC CONJUNCTIVITIS

There are probably few more trying cases which present themselves to the oculist than those of chronic conjunctivitis. Their number is so large, and past experiences have usually yielded such unsatisfactory results, that the ophthalmologist finds it difficult to become interested in each new case and to consider it as an individual problem rather than as a member of an unsatisfactory and relatively hopeless group. He generally prescribes, without investigation, the routine treatment with astringent eye washes. But as a matter of fact there are few more interesting problems than those involved in the successful diagnosis and therapy of a case of chronic conjunctivitis.

The first essential is to discover the etiology. The similarity in appearance of most cases does not necessarily mean that the cause is the same. Until the etiology is discovered and the underlying cause considered there is not much hope of a cure. Simple astringents and collyria may hold the process in check, but the percentage of cases which will be cured by these is extremely low.

It must be remembered that in these long continued inflammations the contiguity of the mucous membranes of

conjunctiva, canaliculus, lacrimal sac and nose has caused an infection of all of these tissues, no matter which one was primary. Therefore it is important that all of these parts be treated.

Reference to the nasal mucous membrane leads naturally to a consideration of the latter as a cause of the conjunctivitis. Chronic catarrh produces mucous membrane changes which extend upward through duct and sac, with resultant interference with drainage of the tears and later direct infection by continuity. This is one of the commonest causes of low-grade conjunctivitis, so that in every case the nose should be carefully examined and any pathology treated. The lacrimal sac too should be frequently irrigated with the chosen antiseptic.

Another important source of trouble is sensitization of the individual to some protein. The commonest type of irritation is that from the pollens and is often associated with nasal hypersensitivity. Any other protein may be the cause, however. Feathers in pillows must be considered. Then too, but less frequently, various foods act as poisons.

The skin tests are becoming very much the vogue and are undoubtedly excellent, but too much stress is often laid on them. A negative test is not necessarily exclusive. These tests indicate whether or not the individual is protein sensitive, rather than identifying the particular protein to which he is sensitive. If the patient is found to be anaphylactic, tests of exclusion of the various possibilities must be made. And here it is important to remember that even the smallest quantities of the protein will be sufficient to keep up the reaction.

Another type is due to deficiencies. One case is most distinctly recalled in which a year's treatment with almost every drug known to ophthalmology failed to cure a purulent conjunctivitis. Repeated cultures and smears were negative. It finally developed that this individual never touched butter or any of the foods containing vitamin A. He was put on cod liver oil, with prompt recovery from the conjunctivitis. Two or three times he experimentally discontinued its use, with an immediate return of his trouble.

As for direct treatment, astringents have held first place, and of these probably zinc salts have been most popular, but are unsatisfactory because of their transitory effects. The silver salts are excellent, but tend to cause staining and are lacking in penetration. Among the new silver preparations targesin is said to combine all of the good qualities of silver and to be free from the bad.

Whatever the local treatment used the essential thing is the search for the underlying cause and its eradication.

Lawrence Post.

LINKSGLAUKOSAN OR LEVOGLAUCOSAN

Whatever may be the final judgment as to the value of glaucosan in glaucoma, for some time to come the drug is likely to form a part of the international pharmacopœia of ophthalmology, and it will be the subject of fairly numerous contributions to the periodical literature of our specialty.

Because the drug was first prepared and used in Germany, and because trade announcements concerning it have been satisfied to employ the original German form of the name of the remedy, it is not surprising that American medical writers should have continued to mention it by this German title rather than an English equivalent.

The English language (still, with some modifications, employed by the American people) is usually adequate for the tasks imposed upon it; although now and then, as for example in the case of the German word "Anlage", we encounter an expression of foreign origin for which no satisfactory English (or American) rendering seems possible.

But in English and American medical literature there can hardly be any valid excuse for continuing to speak of "Linksglaukosan." It would not be very much less logical to use such forms as "linksrotatory" and "Linksrotation". The first component of the term "Linksglaukosan" merely points to the fact that this derivative of the suprarenal capsule rotates polarized light to the left, or in other words is levorotatory. The normal English equivalent for the German word "Linksglaukosan" is "levoglaucosan".

W. H. Crisp.

BOOK NOTICES

Étiologie et traitement des blépharites. By Professor E. Aubaret of Marseille. A report presented to the Société Française d'Ophtalmologie, May 14, 1929. Published by Masson et Cie at the book store of the Académie de Médecine, 120 Boulevard Saint-Germain, Paris VI[e], 1929. (Price not given.) Octavo, 135 pages, unbound.

This "report", upon a subject definitely assigned by the French ophthalmological society, attempts to establish an etiological classification of various types of blepharitis. The monograph opens with a statement of anatomy and embryology. An important position is given to eczema as affecting the eyelids. Under this general head are discussed the following causes: heredity, the influence of hygiene and of food intoxication, organic insufficiencies, mechanical, physical, and chemical irritants, bacteriology, impetiginous blepharitis and other dermatoses, blepharitis especially involving the sebaceous meibomian and sweat glands, follicular blepharitis, sycotic blepharitis, acneiform blepharitis, and foruncular blepharitis.

A second chapter deals with the influence of various infectious and parasitic diseases upon blepharitis, a third chapter with the part played by other ocular disturbances and by errors of refraction; while the second part of the monograph, consisting of forty-six pages divided into three chapters and a number of subdivisions, takes up the treatment of the various types of disturbance.

W. H. Crisp.

National Society for the Prevention of Blindness, 14th annual report. Office of the Society, 370 Seventh Avenue, New York City.

This fourteenth annual report of the society formerly known as the National Committee for the Prevention of Blindness is a fascinating account of the work of the society for the past year. It emphasizes especially the following features: the spirit of cooperation between this society and a number of other national organizations; a study of international aspects of the prevention of blindness, undertaken jointly with the League of Red Cross Societies, and a report of which will be published in 1929 in both the English and the French languages; an extensive cooperative educational campaign with the American Federation of Labor to reach five million families of working men and women; the progress made toward the elimination of ophthalmia neonatorum, the frequency of which as a cause of blindness among the children entering schools for the blind is said to have diminished sixty-eight per cent in the last twenty years; the Society's educational activities in promoting tests of the vision of children in the preschool age; and the rapidly growing movement for the establishment of sight-saving classes in the schools of the larger cities, 318 such classes being now in existence throughout the country, but the total need for these classes being estimated at approximately five thousand classes.

(Abbreviated from the Society's summary of its annual report.)

Farbige, insbesondere grüne Gläser als Augenschutz, ein Rückblick und Ausblick (Tinted, especially green glasses for ocular protection, a retrospect and prospect).

Professor Dr. Albert von Pflugk, ophthalmologist in Dresden. Quarto, 22 pages, with 5 illustrations in the text and 4 color plates, cardboard covers with linen back, price 8.00 marks. 1929, Verlag von S. Karger, Karlstrasse 39, Berlin.

This slender volume will delight the student of ophthalmic history. The excellent color plates portray chiefly a large variety of ancient nose-glass and spectacle mountings in which were contained lenses tinted in green or exceptionally in yellow or blue. Most of these fall within the eighteenth century, and they are of German, French, Italian, and Swedish origin. The text discusses the personalities of the original owners of these glasses, the special purposes to which the glasses were applied (for example, the chase), quotations from old writings as to their value and manufacture, and the focal curvatures with which they were combined.

W. H. Crisp.

CORRESPONDENCE

Reading difficulties in childhood

To the editor:

The editorial on reading difficulties in childhood, in the JOURNAL for February, 1929, deals with a class of patient which seems to be not uncommon, and the members of which have long been considered as victims of what is usually referred to as "word blindness". This condition—it is hardly a disease—has been the subject of a number of articles by Hinshelwood and others, and after one's attention has been called to its existence it is found to be by no means rare. It is simply an inability to read, that is, to recognize the printed word. It is not to be confused with the situation that exists when the child's trouble is a palpable defect of vision, but it commonly occurs in children with normal vision and normal eyes. We can all look back on schoolmates who were "poor readers", and possibly we ourselves have suffered. These children are usually bright in all mental tests and memory tests, they are usually good in exercises depending on the recognition of figures, but they are very poor in everything based on reading. They learn quickly "by ear". Such a child is likely to be considered backward or stupid, and it is hard for teachers and parents to recognize the actual state of affairs. The defect is not easily remedied, in fact it may never be remedied. There seems to be no definite pathology, but clinically it is a very real thing, to which we should all be alive.

E. C. Ellet.

Memphis.

Mydriasis from Jimson weed

To the editor:

Dr. Patton's article in the May Journal on mydriasis from Jimson weed was read with much interest. I have found that the leaves as well as the seed will produce mydriasis.

Several years ago, I saw a patient with one pupil widely dilated who gave this history: He had been pulling Jimson weeds out of an old hog lot. The leaves were very juicy and, while his hands were almost wet with the juice from the leaves, he had rubbed his eye. Soon afterward he noticed that he did not see well and he found his pupil dilated. The dilatation did not yield to eserin and lasted about a week.

During my boyhood in Indiana, quail would seem "to go on a big drunk" when the Jimson seed became ripe. They would be rather numerous in town, would fly against houses, become entangled in trees, and behave in a very disgraceful way. They were supposed to be drunk from eating the Jimson seed. I am sure the reason for this depraved conduct was that they were blinded by the mydriatic effect of the Jimson seed. The quail seemed to be the only bird to go on this kind of spree.

H. L. Scales.

Hutchinson, Kansas.

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, including parasites
18. Hygiene, sociology, education and history

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6. CORNEA AND SCLERA

Fuchs, A. **The strength of the cornea and the marginal ring of Schwalbe.** Zeit f. Augenh., 1929, v. 67, Feb., p. 129.

The resistance of the cornea to pressure results from strength of the connective tissue fibers, the elastic elements, and particularly Descemet's membrane. The importance of the latter structure is shown by the fact that in eyes afflicted with staphyloma almost no stretching takes place in those parts of the iris which are adherent to parts of the cornea where Descemet's membrane is still intact.

In general the cornea is like a dome; like this type of structure elsewhere the cornea is thinner at its center. But because the cornea must withstand pressure from within the mechanics of reservoir structure rather than of domes apply to the cornea. To reenforce reservoirs parallel as well as meridional thickenings are applied. Such reenforcements are also present in the cornea in the anterior and posterior marginal rings. The latter is always well developed. The anterior ring, also known as the ring of Schwalbe, is absent in most eyes, is suggested in some, and is occasionally tremendously developed.

Fuchs describes the details of this ring and gives its measurements as observed in histological preparations. This ring is occasionally of practical importance in that it may afford considerable resistance to the entering spatula during cyclodialysis and may even cause the spatula to emerge behind the iris. *F. H. Haessler.*

Gasteiger, H. **Treatment of diseases of the cornea with ultraviolet light.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 344-350.

Out of seventy-five cases of serpent ulcer which were treated with ultraviolet light, thirty-two were very severe, twenty-six moderately severe, and seventeen light. Pneumococci were found in fifty-eight, diplobacilli in sixteen, bacterium coli and staphyloccus albus in one. In sixty-nine vision was preserved, in six it was lost (with two enucleations), i.e., a loss of eight per cent. Compared with this there had been a loss of twenty per cent of all cases treated previously. The method was also employed with good results in marginal eczematous ulcers, in herpes, and in filamentous keratitis; whereas in deeper processes it was not successful.

C. Zimmermann.

Ishikawa, F. **A contribution to progressive scleroperikeratitis (Szily).** Klin. M. f. Augenh., 1929, v. 82, March, pp. 325-335. (5 ill.)

A peasant aged forty-one years who had been at the hospital for about two months on account of acute rheumatic polyarthritis noticed successively on both eyes increasing visual disturbances with ciliary pains. The episclera was thickened in the form of a succulent injected roll of tissue, which encroached upon the cornea. Then circumscribed ulcers developed in the conjunctiva, and a circular ulcer in each cornea. Microscopically the changes consisted in massive infiltration with mononuclear leucocytes, with a tendency to necrosis. Syphilis and tuberculosis could be excluded as etiological factors. Accumulations of epithelioid cells, which frequently form the nucleus of the nodular aggregations of lymphocytes, are according to Szily characteristic of the affection. The author, however, does not lay very much importance on the occurrence of epithelioid cells for diagnosis. Perhaps the disease had some causal connection with the rheumatism. *C. Zimmermann.*

Löwenstein, A. **The etiology of keratoconus.** Graefe's Arch., 1929, v. 121, p. 736.

In the majority of cases, keratoconus is bilateral, develops at puberty and occurs in females. Pregnancy frequently leads to rapid progress of the disorder. It has been found that the integrity of the sympathetic nerve trunk is necessary for proper nourishment of the cornea. In a woman sixty-three years old, there was noted a keratoconus of the right eye eight weeks after strumectomy on the same side. Fourteen years after the operation it had remained confined to the same side. It is easy to understand how the cervical sympathetic nerve trunk might be injured in goiter operations. *H. D. Lamb.*

Merkulow, J. **Physical methods of treatment of band-shaped corneal opacity.** Zeit. f. Augenh., 1929, v. 67, Jan., p. 73.

A primary form of band-shaped corneal opacity which results from exposure to thermic, chemical or mechanical irritants is distinguished from the secondary form which occurs in eyes afflicted with iridocyclitis and glaucoma. Little has been added to our knowledge of this disease since Graefe's original description in 1869. The disease is characterized histologically by formation of sclerotic tissue just under Bowman's membrane, then over it, with final destruction of this tissue and the formation of calcium and hyalin deposits. A case reported by Ohm is the only one in which therapy has been effective.

The eyes of a child of fifteen years afflicted with this disease were treated by the author by means of x-rays. The visual acuity rose from 0.13 to 0.16 in the right eye and from 0.08 to 0.2 in the left eye. Subluxation of the lens in the right eye was partly responsible for the poor functional result, because the cornea of this eye became as clear as that of the other. *F. H. Haessler.*

Rieger, H. **Optochin ointment in the prophylaxis of ulcus serpens.** Zeit. f. Augenh., 1929, v. 67, March, p. 215.

During the year in which optochin ointment has been applied to all eyes seen in Lindner's clinic because of superficial injuries, only one case progressed to serpent ulcer. In the two preceding years thirteen cases occurred. As all other factors were reasonably constant the author feels justified in concluding that optochin ointment is effective prophylactically in such cases. *F. H. Haessler.*

Saeger, F. **Stimulation of vascular proliferation in the cornea with galvanocautery and remarks on filaria of the eye.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 223-229. (1 ill.)

In two cases of purulent infiltration of the cornea with relapsing hypopyon

Saeger illustrated the beneficial effect of a radial furrow of galvanocauterization from the limbus into the infiltrated area. This stimulated proliferation of blood vessels, with recovery.

A man aged forty-nine years came in 1921 with swelling of the left lower lid, which showed worm-like motions under the conjunctiva by a filaria loa that was excised by Szily. Intraocular filaria was surmised but could not be confirmed to date.

C. Zimmermann.

Triebenstein, O. **The question of rodent ulcer.** Klin. M. f. Augenh., 1929, v. 82, Feb., 212-222.

A critical study of the literature and the author's own observations render it most probable that rodent ulcer of the cornea is not a clinical picture of uniform etiology, but may develop, under certain unknown conditions, from etiologically entirely different diseases of the cornea. Triebenstein seems to have proved, for example, that the late stages of certain forms of corneal rosacea are nothing but rodent ulcer. *C. Zimmermann.*

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Alexiades. **A case of pronounced bilateral symmetrical corectopia.** Arch. d'Opht., 1929, March, v. 46, p. 154.

A boy eleven years old with no history of anomalies in the family had the right pupil placed between the seven and ten o'clock positions, almost at the limbus. The left pupil was placed between two and four o'clock in the same region. The pupils reacted to light, except that the external portion of the sphincter in the small rim of iris seemed atrophied. There was a small filament of pupillary membrane in the left eye when the pupil was dilated with atropin. There was slight anisocoria, the right pupil being larger. There was marked iridodonesis on the right side, slight on the left. The iris crypts were absent and there seemed to be an absence of the right lens and a very small lens in the left eye, in which the pupillary area with undilated pupil was outside the lens border. The vision in the right eye was 1/15 and in the left 1/10, but with +10.00 sphere the vision was 5/10 in both eyes. The anomaly was explained by pressure of the amniotic membrane during formation of iris and lens.

M. F. Weymann.

Kaganowa. **Rare iris lesions.** Zeit. f. Augenh., 1929, v. 67, Jan., p. 61.

A case of iris sarcoma and one of tuberculoma of the iris are described because of their rarity. Tuberculosis of the eye seems usually to be secondary to infection of the glands, particularly those about the bronchi. The formation of tubercles in the eye is almost limited to children and young individuals. Histologically two forms are distinctly visible, a benign proliferative form which tends to form scar tissue and a malignant exudative form leading to caseation and necrosis.

F. H. Haessler.

Kaminskaja-Pawlowa, S. A. **Changes of the iris in tabes.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 340-343.

Twenty-five patients from thirty to fifty years of age affected with tabes at different stages were examined with the slit-lamp. Almost all showed diminution of the trabeculæ, which were converted into thin white threads; shrinking and sometimes complete obliteration of the crypts, so that the iris lost its relief; atrophy of the posterior pigment layer; and pigment-like dust on the surface of the iris and sometimes on the posterior surface of the cornea. The atrophy involved sometimes the whole iris, sometimes sectors of it. It is of neurogenous origin, due to an affection of the sympathetic nervous system, and is one of the trophic disorders characteristic of tabes. It is as frequent as the Argyll-Robertson symptom and commoner than optic atrophy, and is therefore an important and characteristic diagnostic sign.

C. Zimmermann.

Koyanagi, Y. **Dysacusis, alopecia, and poliosis in severe nontraumatic uveitis.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 194-211. (5 ill.)

Reports of sixteen cases presenting this syndrome, arranged in tabular form, and detailed clinical histories of four of them more recently observed, illustrate that the otological and dermatological phenomena are not accidental complications of uveitis, but, as in sympathetic ophthalmia, are undoubtedly in connection with it. In discussing the subject the author assumes that in this uveitis the hair and skin affections and also the disturbance of hearing are not sequels but occur simultaneously from a still unknown cause. He could not find an obvious reason for an anaphylactic toxic action of the uveal pigment, which today even in sympathetic ophthalmia he thinks is to be regarded with skepticism. *C. Zimmermann.*

Löwenstein, Arnold. **Transfixion with keratome.** Zeit. f. Augenh, 1929, v. 67, Jan., p. 68.

Löwenstein advocates the use of Wessely's narrow keratome (ten mm. wide at base and twenty mm. long) for transfixion in iris bombé. It has the advantage that one can choose the position of entrance, that discission of the remains of an absorbed lens can be done at the same time, and that iridectomy is possible as part of the same operation whenever indicated.

F. H. Haessler.

Lundsgaard, K. K. K. **A case of iridocyclitis associated with intermittent fever.** Acta Ophth., 1929, v. 6, no. 4, pp. 408-410.

In 1924 Keefer of Baltimore proved that the gram-negative coccoid bacillus described by Bang was pathogenic for man. The organism produces infectious abortion in cows and is transmitted to man through milk. The case described by Lundsgaard occurred in a farmer who had treated his infected cows and had drunk unboiled cream. He developed cough and fever with remissions and a daily chill. An iridocyclitis complicated the general infection and yielded to the constitutional treatment. By exclusion of other causative factors and by the agglutination test, the eye condition was thought to be due to the same organism. *E. M. Blake.*

8. GLAUCOMA AND OCULAR TENSION

Basso, D. **The compensation of glaucoma by means of miotics.** Ann. di Ottal., 1929, v. 57, Jan., p. 11.

The author raises two important questions. Is glaucoma ever cured by means of miotics alone? If we are obliged to answer this question negatively, yet, in face of the fact that operative measures are not always successful, may we not with miotics suceed in accomplishing all that is frequently considered as an operative cure, namely arrest of the symptoms threatening the functional use of the eyes? It is often a matter of great responsibility to determine whether an operation should be performed or not. The author concludes that certain cases are definitely cured. In others in which for any reason an operation can not be done, a condition of compensation results in which with slight elevation of tension and pressing forward of the iris and the crystalline lens an apparent adaptation to these conditions develops in which vision may be retained and the fields uninvaded for an indefinite period. Since practically all cases are cured by means of operative measures done in the prodromal period and the earlier the operation the better hope of a successful result, it is a delicate question whether or not miotic treatment is justified when the diagnosis of glaucoma is established.

Park Lewis.

Hagen, S. **Gynergen treatment of glaucoma simplex.** Acta Ophth., 1929, v. 6, no. 4, pp. 350-353.

Hagen reviews the work and results of several authors who have employed gynergen in the treatment of glaucoma. He treated seventeen cases

of glaucoma simplex and expresses disappointment with his results. In five cases the pressure curves were uninfluenced and in the others only an insufficient lowering or transitory effect was noted. In no case was a lasting normal tension obtained. Both the tablet per os and the subcutaneous injections were employed, the latter producing better effect than the former. At best it seemed only to aid the other methods of treatment which were practiced. *E. M. Blake.*

Hamburger, Carl. **The treatment of glaucoma.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 236-239. (1 curve)

In controverting the opinion of Stock that the iritis observed after a certain percentage of glaucoma operations is not secondary, but that glaucoma is an iritis clinically not ascertained before operation, Hamburger argues that the iritis is produced by these operations, and that it is beneficial because acute ciliary inflammation is the strongest "diuretic" for the eye. It represents the principle of softening in the treatment of glaucoma.

The author also reports the case of a man aged fifty-four years with right absolute glaucoma after three operations and left tension fifty millimeters in spite of two operations. The patient refused further operations and has been treated with glaucosan. Eserin twice, five minutes apart, followed by glaucosan at fifteen minute intervals, twice in the four sittings within two months, controlled the attacks and the patient could always do his work the next day.

C. Zimmermann.

Wiegmann, E. **Can a result of injury (healed-in iris prolapse) prevent glaucoma?** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 247-248.

The right eye of a man aged fifty-six years was for many years affected with glaucoma simplex for which an iridectomy was performed. It showed excavation and atrophy of the optic nerve and had been blind for four years. The patient had been calling at regular intervals for control of his left eye. The vision of this eye was 5/5. At 1.5 mm. from the nasal limbus a vertical scar with incarcerated iris prolapse and a broad coloboma was visible, from an injury by a gun cap during childhood. The eye thus showed a result analogous to Holth's iridencleisis, which had perhaps prevented the outbreak of glaucoma in this eye. *C. Zimmermann.*

9. CRYSTALLINE LENS

Altschul, R. **Congenital amyotonia with juvenile cataract.** Riv. Oto-Neuro-Oft., 1928, v. 5, Nov.-Dec., pp. 534-540.

Juvenile cataract is rarely a symptom of purely nervous pathology, but it is very frequently a symptom of neuromuscular pathology, especially in systemic diseases characterized by muscular hypertony. Some authors state that in subjects affected by rickets with cataract, latent or manifest symptoms of tetany exist. The author describes a case of cataract in a five-year-old girl affected by congenital amyotonia (hypotony of the muscles of the neck, trunk, and limbs). Almost all writers admit that the etiologic factor of congenital or juvenile cataract is dysfunction of some internal secretory glands, and some of them admit also that congenital amyotonia is due to an endocrine disorder. It has been noted that the cataract which manifests itself in experimental or accidental tetany is caused by diminution or suppression of the parathyroid function. The same principle can be applied as to the cause of endogenous tetany and dystrophic myotonia. The present case, however, is one of atony instead of muscular hypertony; it is just the opposite of tetany and myotonia. Thus a pure hypoparathyroid genesis can not be considered, and hyperfunction of the parathyroids has to be admitted as the cause.

The modern conception of endocrine diseases does not admit hypofunction or hyperfunction of an internal secre-

tory gland, but rather a dysfunction in which only the disturbances of hyposecretion or hypersecretion predominate without exclusion of the antagonistic function; so that in this case a double disturbance of the parathyroids must be admitted; their hyperfunction as the cause of the amyotonia and their hypofunction as the cause of the cataract. (Bibliography.)

Melchiore Lombardo.

10. RETINA AND VITREOUS

Horniker, E. **The question of nephritic retinitis.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 336-340.

In a former publication Horniker has emphasized that recent retinitic changes almost exclusively occur with high blood pressure, and has called attention to the frequency of ischemic alterations of the retinal arteries (based on observation of over six hundred cases), but he concludes that these alone cannot entirely explain the phenomena of nephritic retinitis. With the majority of authors, he assumes a toxic agent in connection with the vascular changes, but the mode of its action is still unknown. *C. Zimmermann.*

Koyanagi, Y. **Displacement of the retina into the disc in glaucoma.** Klin. M. f. Augenh., 1929, v. 82, March, p. 317. (6 ill.)

A woman aged forty-three years, suffering from diabetes and nephritis, complained of failure of sight for about two months, and relatively sudden blindness of her left eye ten days previously. The eye showed numerous extensive retinal hemorrhages and a tension of 66 mm. Hg. On account of unbearable pain it was enucleated. Anatomically the sinus of the anterior chamber was completely closed by broad synechia of the root of the iris, the retinal vessels showed thickening and hyalin degeneration of the walls, and the retina itself cystoid degeneration. At one and a half disc diameters from the temporal margin of the disc it was torn loose and drawn over the border of the sclerochoroidal canal into the disc, which presented incipient formation of caverns, but no pathological excavation. This is attributed to traction by the ectatic scleral lamina, with abnormal stretching of optic fibers.

C. Zimmermann.

Lange, Ilse and Lange, Fritz. **Retinal hemorrhages in hypertension.** Klin. Woch., 1928, v. 7, Nov. 25, pp. 2286-87.

A study of sixty cases of retinal hemorrhage is given, in which the vessel changes and the associations with hypertension are noted.

A review of Romberg's work in 1904 is given, as the first to differentiate arteriosclerosis from hypertension, and the author's findings substantiate his findings.

Of the sixty cases fifty-seven showed a hypertension over 160 and most of them over 200 mm. Hg. Of these fifty-seven, fifteen cases had no indications of an arteriosclerosis and the vessels showed none of the characteristic changes such as variation in caliber and thickness of walls, with the changes increased at crossings of the vessels. In the other forty-two cases there were clinical indications of hypertension with arteriosclerosis. The older the patient, the oftener were the two combined.

In three of the sixty cases only were retinal hemorrhages found without hypertension being present. Therefore the authors conclude that retinal hemorrhages occur with hypertension and not with pure arteriosclerosis. No subconjunctival hemorrhages in hypertension as described by Weeks were found. In cases of apoplexy the cerebral hemorrhages were of capillary origin rather than from the larger vessels. *Beulah Cushman.*

Pines, N. **Sclerosis of the retinal vessels.** Brit. Jour. Ophth., 1929, v. 13, April, p. 161, and May, p. 225. (Continuation and conclusion.) (See also Amer. Jour. Ophth., 1929, June, p. 540.

(April issue.) In this contribution the author discusses his subject under the following headings: translucency

of the retinal vessels; white lines at the crossings; tortuosity; general narrowing of the arteries; silver wire arteries; changes in the lumen of the vessels; arterial pulse; arteriovenous compression; aneurisms and retinal hemorrhages. His summary is as follows: In spite of the lack of direct anatomical evidence, the vessels in the normal eye run on the disc and on the retina through channels of perivascularis. The disc is covered by a transparent and strong membrane of mesodermic origin. The vessels on the disc are under pressure in the sagittal and horizontal diameters, which is greater than that on the retina. When they become sclerotic they first lose their translucency, then change their color, and "dot" their light reflex, then the sclerotic perivascularis appears, first as white lines at the crossing points, and later on it takes a leading part in arteriovenous compression. This thickened perivascularis plays an important part in every pathological vascular process in the sclerotic eye, but its action is chiefly a local one affecting separate parts of the vessel, especially at crossing points. Essential hyperpiesis greatly increases and aggravates all the sclerotic signs of the retinal vessels. It is quite probable that there is a special predilection for the retinal vessels and that these are affected earlier and more severely than other parts of the vascular tree, except the cerebral vessels and perhaps those of the kidney. (Twenty-one illustrations.)

(May issue) Atheroma of the heart or large vessels with normal blood pressure, even in a severe form, does not produce any special changes in the retinal vessels; on the other hand, a severe atheroma of the retinal vessels and even of the cerebral ones may spare the heart and the aorta. Essential hyperpiesis, when added to atheroma, produces marked and advanced retinal changes which depend chiefly on the degree of arterial hypertension.

Involutionary arteriosclerosis, after a certain age, is present in everybody. In an elderly person with a fundus in which the translucency only is lost, with corresponding changes in the light reflex and in the color of the vessels, without white lines at the crossings and without arteriovenous compression, one can be sure that the blood pressure is normal.

"Retinitis diabetica" is not a good term, in that retinitis, with edema of the retina, does not exist in pure diabetes. The exudate is clearly defined, frequently surrounded by pigment; the vessels are clearly seen. Even mild diabetes attacks the retinal vessels, but most probably to the same degree as the vessels are affected in the other parts of the body. Aggravation of the retinal changes, hemorrhages, and especially edema are often combined with rise of blood pressure and lowering of the specific gravity of the urine.

The coordination between kidney and retina is discussed. Edema of the retina indicates impaired kidney efficiency. Are retinal changes secondary to the vascular changes or are they primary—an actual disturbance of retinal metabolism due to the kidney intoxication? The author believes the latter is correct.

For the retinal vessels essential hyperpiesis means sclerosis of the perivascularis. The retinal perivascularis contains the lymphatic vessels. If the perivascularis of other vessels also contains the lymphatic vessels, then this form of essential hyperpiesis is connected with toxins chiefly circulating in the lymph. The lymph is produced in the intestinal tract and the cells of the body, hence these toxins, in great part at least, are produced in the intestines either as by-products of metabolism or of the bacterial flora.

This very important contribution is strongly recommended for study in the original. *D. F. Harbridge.*

Reed, E. and Møller, H. U. **Concerning ophthalmoscopically demonstrable sclerosis of the retinal arteries.** Acta Ophth., 1929, v. 6, no. 4, pp. 317-331.

Reed and Møller draw some rather

striking conclusions from a study of 155 patients, all of whom were between forty-five and sixty-five years and who suffered from diseases in which general arteriosclerosis was present. They found sclerosis of the retinal arteries present—in only six cases four per cent. They therefore feel that there is little justification for the view that retinal arteriosclerosis is an early sign of vascular change. Furthermore, the opinion that retinal arteriosclerosis is closely associated with cerebral arteriosclerosis is unfounded. These views are certainly at variance with those of most observers, and one can only conclude that the writers have in mind advanced sclerotic changes and have not regarded the finer changes observed in early sclerosis. *E. M. Blake.*

Rönne, H. **Concave loupe as an optical aid in retinitis pigmentosa.** Klin. M. f. Augenh., 1929, v. 82, March, p. 383.

If with normal vision the visual field is concentrically contracted to ten or fifteen degrees in diameter it corresponds to a large eyeglass held at a distance of thirty or forty centimeters. Through from —12 to 16 diopters in a lorgnette, a patient affected with retinitis pigmentosa will have a much larger visual field than with the naked eye, on account of the greatly diminished size of objects through the concave glass; and this will help him in searching for things and in orientation. By ordering a double lorgnette two diminutions are available by using one glass or both together.

C. Zimmermann.

Scotti, Pietro. **On a case of retinitis punctata albescens.** Ann. di Ottal., 1929, v. 57, Jan., p. 45.

In describing a case of this exceedingly rare disease the author gives a valuable résumé of the cases previously described, with the familial conditions and optical findings reported. The clinical picture presented in this case was of slowly progressive loss of sight affecting both eyes, limitation of the visual fields, dichromatopsia, and hemeralopia. A youth of twenty-one years whose parents were first cousins was the only one of nine children affected. The ophthalmoscopic examination showed no alteration in the optic disc or narrowing of the arteries. The entire retinal surface presented a grayish brown appearance with a wide line of choroidal atrophy and marked sclerosis of the choroidal vessels. The most characteristic alteration was the appearance of numerous bright white patches scattered through the ocular fundi and more particularly in the periphery, where they formed groups. The macular zone and the peripapillary region were wholly spared from this invasion. These little white patches were in an area superior to that of the choroid and inferior to the retina, the vessels of which passed over them. The author accepts Lauber's conclusions that "fundus albipunctatus cum hemeralopia congenita" may be considered as a congenital anomaly influenced by heredity probably dependent on a dyscrasia which during intrauterine life affected the neural epithelium of the retina through the choriocapillaris. In its more marked form it has a serious and slowly progressive character in which dyscrasia must have been active for a long period. *Park Lewis.*

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Bursuk, G. **Treatment of optic nerve atrophies by retrobulbar injections of weak solutions of atropin.** Russkii Opht. Jour., 1929, March, pp. 357-364.

The author used retrobulbar injections of small doses (0.5 to 1.0 c.c.) of a 1 to 1,000 atropin solution in forty-one cases of simple and postneuritic optic nerve atrophy. This treatment was mostly followed by a slight increase of visual acuity, but only in 13.5 per cent of all the cases treated was the improvement decidedly noticeable. As a rule the effect of the atropin was temporary. The author does not agree with Abadie and Zamkovsky that the action of atropin in optic

nerve atrophy is due to dilatation of the central blood vessels with resulting improvement of nutrition. No such dilatation could be observed ophthalmoscopically, and it is hardly plausible because of the sclerosis of the arteries in advanced optic nerve atrophy (Greeff). There is also no pharmacologic proof of a vasodilator effect of atropin in weak solutions, and the temporary improvement of visual acuity may be due to simple irritation of the optic nerve fibers. As a whole, retrobulbar injections of atropin in the treatment of optic nerve atrophies belong to the same class of remedies as strychnin, galvanization, and so on. *M. Beigelman.*

Bussola, E. **Acrocephalosyndactylia with bilateral postneuritic optic atrophy.** Riv. Oto-Neuro-Oft., 1928, v. 5, Nov.-Dec., pp. 503-520.

The author describes a case of Apert's syndrome in a boy of six years, who, among congenital symptoms like frontal crest, narrow palate, saddle nose, and limited mental development, showed characteristic tower skull and syndactylia of the four limbs with absence of some phalanges. The eye apparatus showed slight ptosis, exophthalmus, straight forward alternating strabismus, horizontal nystagmus, neuroparalytic keratitis, absence of conjunctival and corneal reflexes, white papillæ with irregular margins, and perivasculitis of the retinal blood vessels. As to etiology, the family and personal history, and objective symptoms including senile appearance, ozena, and defective ossification, as well as cerebropathic and some other conditions, suggest that the case, in spite of a negative Wassermann, is one of heredolues. As to pathogenesis of Appel's disease and the visual disturbances connected with it, Bertolotti's researches demonstrate that the main lesion lies at the base of the skull. Radiographs have demonstrated anterior rotation of the anterior cranial fossa, frontal rotation of the great wing of the sphenoid, and a precocious synostosis of all the cranial bones. The increased intracranial pressure is the result of the latter condition, while the abnormal position of the sphenoid makes the optic canal narrower than normal, and the resulting compression of the optic nerve explains the pathologic findings in it. (Bibliography.)

Melchiore Lombardo.

Gérard, Georges. **The question of the sphenoidal sinus in ophthalmology.** Clin. Opht., 1928, v. 17, Sept., p. 482.

The author believes that the etiologic relationship of sphenoidal sinus disease to optic neuritis occurs much less frequently than commonly supposed, and states that the diagnosis can never be absolute but simply probable, and then only by exclusion. He reports the case of a boy aged fifteen years the vision of whose right eye had suddenly failed after a violent coryza, and in whom a diagnosis of optic neuritis of sphenoidal origin had been made. Careful examination revealed that the lowered vision was due to hypermetropia and that no optic neuritis was present. The second case was in a man aged twenty-seven years who had had a similar diagnosis, but who refused to submit to sinus surgery and allowed a bilateral optic neuritis to progress for over a year without treatment, resulting in almost complete optic atrophy. Antiluetic treatment, even though begun at this late date, resulted in a slow gain in vision. The author insists that one should never be content with a diagnosis of sinus etiology but should commence specific therapy even though the Wassermann continues negative. *Phillips Thygeson.*

Horn, L., and Kogerer, H. **The result of reexamination of patients with optic atrophy treated with air injection.** Zeit. f. Augenh., 1929, v. 67, March, p. 207.

Of five cases reexamined from nine months to twenty-one months after treatment by suboccipital air injection combined in some cases with arsenicals and malaria, there was very

slight increase of visual acuity in one, continued loss of vision in another, and no change in visual acuity, field, or appearance of the optic nerves in three. *F. H. Haessler.*

Meyer, H. **Investigations on the toxic action of trichlorethylen, especially on the eye.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 309-317.

A man who worked in rooms impregnated with trichlorethylen noticed in reading a small central shadow. The vision was 5/4, but in the right eye there was a small paracentral scotoma for blue. In mydriasis a small black spot was seen to the nasal side of the central fovea. This remained while under treatment with salicylic preparations, but the scotoma diminished. Five dogs were submitted partly to narcosis with trichlorethylen, partly to subcutaneous injections. The autopsies showed fatty degeneration of the liver, but no changes in the optic nerve till far behind the chiasm. As Römer has shown that the optic nerves of some species of animals respond differently to toxic actions, the experimental results can not definitely be applied to human pathology, so that the possibility of retrobulbar neuritis, as observed by some authors, can not be absolutely denied.

C. Zimmermann.

Sabatzky, Kurt. **Unusual number of cases of transient optic neuritis in and after influenza.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 351-353.

The clinical histories of eight patients, aged from eleven to sixty-five years, are reported. Either beginning with influenza or after its disappearance sudden optic neuritis without any other neurologic symptoms set in for a few days, followed by perfect restitution and normal sight, so that an etiological connection with influenza was assumed. *C. Zimmermann.*

12. VISUAL TRACTS AND CENTERS

Moore, R. Foster. **A hemangioma of the meninges involving the visual cortex.** Brit. Jour. Ophth., 1929, v. 13, May, p. 252.

A boy aged twelve years, having defective sight in the left eye, feared the right was also becoming impaired. Vision with correction was: right 6/9 partly, and left 6/6 partly. There was a slight congenital dislocation of the lenses, and a small coloboma of the left optic disc. There was an incomplete right homonymous hemianopsia. The patient had a nevus of the left face and eyelids. In the absence of any other likely cause, it was believed that the nevus involved the visual cortex. An x-ray picture showed the presence of a wedge-shaped tumor, the apex far forward in the temporal region, the base at the occipital pole above the tentorium. The walls were undoubtedly calcified, to produce so dense a shadow. Owing to the frequency with which buphthalmos has been found to be associated with intracranial hemangioma, this case suggests the need of x-ray pictures in cases of buphthalmos. In congenital abnormalities of the eye, it is strikingly noticeable that the tumor of the brain is on the same side. (Two illustrations and two field charts.)

D. F. Harbridge.

Rønne, H. **Nonhypophyseal affections of the chiasm.** Acta Ophth., 1929, v. 6, no. 4, pp. 332-343.

Rønne points out that the macular fibers cross in the posterior chiasmal angle and will therefore be involved first in hypophyseal disease. Their position also helps to differentiate between hemianopsia due to tract involvement and that of the hemispheres, in the latter case visual acuity being normal. Three cases of tumor of the chiasm are reported, in two of which early and marked visual disturbance was noted. The third case presented blindness in one eye and temporal hemianopsia in the other. Two of the cases were gliomatous, with extension into the optic nerves. Roentgenograms of the optic foramen are suggested as of possible value.

Stress is laid upon the frequency

of absolute central scotomata as a manifestation of retrobulbar neuritis in frontal lobe tumors. New growths in the nasal accessory sinuses and even limited tumors of the orbit may present the same sign. Decompression has restored vision in several cases and papilledema frequently occurs in the eye with normal vision. Frontal lobe tumors often, on the other hand, present irregular hemianopic fields, as do also sphenoidal affections, sclerosis of the internal carotid artery, and internal hydrocephalus. Tabes dorsalis may have its starting point in the chiasm, producing hemianopic types of field defect. The same is true of multiple sclerosis and acute disseminated myelitis.

E. M. Blake.

13. EYEBALL AND ORBIT

Böhm, Fritz. **Diagnosis and treatment of surgical exophthalmos.** Münch. med. Woch., 1929, v. 76, Jan. 11, p. 51.

To the domain of the surgeon are assigned the first four groups of an etiological classification of exophthalmos into (1) tumors, (2) injuries, (3) inflammatory orbital and extraorbital processes, (4) vascular orbital anomalies, (5) metabolic disturbances and intoxications (Basedow's disease), and (6) skull malformations (oxycephaly).

In the first class fall cavernoma, dermoid cyst, osteoma, carcinoma, sarcoma (especially round or spindle-cell), and tumors of the optic nerve. Among injuries basal skull fractures are the most common cause. Vessel anomalies are aneurisms and ruptures of vessels. Rupture of the ophthalmic artery has been reported in three cases.

Points in early diagnosis, prognosis and treatment are discussed and cases are reported in illustration. The deeper the location of a tumor in the orbit the slower the development of exophthalmos. Skull fractures involving the orbit may show no ecchymosis of lids or conjunctiva if the hemorrhage is subperiosteal. Round-cell sarcomata, the most common of primary tumors, often show a diffuse infiltration and are subject to recurrence. If no tumor is found at operation we are dealing with a diffuse tuberculous infiltration or a diffuse lymphangioma and recurrence is likely. Intermittent exophthalmos is always unilateral. For pulsating exophthalmos the operation of choice is ligation of the internal carotid. Krönlein's operation meets all indications in orbital tumor. The only objection to it is the sacrifice of the nerve supply to the upper orbicularis involved in the incision, which often results in lagophthalmos. Payr's modification is advocated. For the usual incision which begins at the semicircular ridge of the frontal bone above the supraorbital margin, this substitutes an incision beginning along the outer portion of the supraorbital margin below the eyebrow, following down along the external margin to its junction with the infraorbital margin, and proceeding to the middle of the zygomatic arch. In the statistics only two out of 114 Krönlein operations resulted in loss of the eye, and further loss of vision has always been checked.

M. Davidson and *M. L. Folk.*

Hamann J. **Aneurism of the internal carotid.** Zeit. f. Augenh., 1929, v. 67, March, p. 210.

A sequela of blunt injury to the skull which may not arise for months or years is aneurism of the internal carotid. In the author's patient, dizziness on stooping was noted three years after a fall on the head resulting in unconsciousness which lasted five minutes. A year later the patient felt that his vision was diminishing in the right eye, particularly in the right half of the field. Bilateral papilledema was found and a buzzing sound was audible through a tube inserted into the right ear. Pressure on the carotid made this sound disappear. One month later diplopia and paralysis of the abducens were noted. After ligation of the right carotid artery the diplopia, the papilledema, and the objectively audible noise disappeared,

and the patient was troubled with head noises only on exertion. Four similar cases have been recorded in the literature. *F. H. Haessler.*

Koby, F. E. **Hydrophthalmos and microphthalmos.** Ann. d'Ocul., 1929, v. 166, March, pp. 200-205.

The case of a boy in whom one eye was hydrophthalmic and the other microphthalmic is given. The former showed in sections almost complete synechia between pupillary membrane and cornea, while the latter gave evidence of intrauterine inflammation with localized retinal detachment drawing the lens backward but permitting normal absorption of the pupillary membrane. *Lawrence Post.*

Stuelp. **The diagnosis, prognosis and therapy of orbital tumors.** Zeit. f. Augenh., 1929, v. 67, Jan., p. 41.

Seventeen cases of orbital tumor are described and the experiences gained from their study are generalized. Before we can diagnose the presence of a true tumor because of an acquired, unilateral, noninflammatory exophthalmos with dislocation of the globe, disturbance of its motility, and a palpable resistance, we must rule out certain orbital processes usually called pseudotumor. Aside from mucocele of the sinuses, myositis of the ocular muscles, unilateral Basedow's disease and the "inflammatory pseudotumor" which manifests itself in edematous and cellular infiltration of the cellular tissue of the orbit we must consider luetic, tuberculous and leukemic processes. Luetic tumors are rare and occur almost exclusively as secondary or early tertiary manifestations in the form of an osteoperiostitis of the orbital margin (preferably the upper) or of gumma of the orbital roof. An accompanying persistent dacryocystitis is suggestive and it is characteristic to find disturbances of motility not corresponding to the direction and intensity of the exophthalmos, due to paralysis of the ocular muscles. Optic neuritis is common and very characteristic is chemosis of the adjacent conjunctiva as well as tenderness to pressure and spontaneous pain in the orbit or head, worse at night.

Tuberculous tumors are rare relative to the frequence of general infection, and usually occur at the lower temporal orbital margin in children and young adults. They frequently perforate and leave a fistula. Pain is usually absent. Excision of tissue for histological study is justifiable because curettage of the area involved is a necessary part of the treatment.

Leukemic disease of the orbit is suspected when general manifestations exist, and a study of the blood picture is essential.

Valuable diagnostic information in cases of true tumor is obtained by palpation during narcosis if necessary, the roentgenogram, oral transillumination as practiced by the rhinologist, and aspiration with a needle large enough to afford passage to small solid particles (cell groups, crystals, blood clot). Where histological study can be made promptly, exploratory excision of part of the mass is not contraindicated even when malignancy is suspected. *F. H. Haessler.*

Villoria, L. L. **Carotid-cavernous aneurism without pulsating exophthalmos.** Arch. d'Opht., 1929, March, v. 46, p. 157.

A man twenty-nine years of age was struck on both sides of the head with a bottle. He did not lose consciousness but had a full sensation in his head after the blow on the right side. He was seen four months later complaining of a pounding noise in his head and a cold sensation in the right nostril upon inspiration. A fracture of the inferior portion of the right orbit could be felt. There was ptosis of the right lid, and the globe looked down and in about fifteen degrees. It did not move except upon looking to the right, when it would look down and in about thirty degrees. This motion was abnormal in that it was opposite to that of the sound eye. There was no light perception and the nerve was atrophic. There was no

exophthalmos and no pulsation. On auscultation one could hear a systolic bruit over the entire head, disappearing with compression of the right common carotid. X-ray examination showed fracture of the lesser wing of the right sphenoid, opacity of the right orbit, flattening of the right sphenoidal fissure and of the sphenomaxillary fissure so great that they were obliterated and did not show in the roentgenogram. The obliteration of these fissures explains why the aneurism did not extend into the orbit and show the usual pulsating exophthalmos. The common carotid was ligated, and this procedure relieved the patient of his head noise. There is no satisfactory explanation for the anomalous movement of the right eye down and to the left when the left eye was rotated to the right.

M. F. Weymann.

Wegner, Wilhelm. **Graphic registration of pulsations of the eyeballs.** Klin. Woch., 1928, v. 7, Nov. 25, pp. 2290-91.

A review of the work that has been done in recording the pulse of the eyeball is given. The dynamometer of Bailliart was used, and Bliedung's and Wegner's instruments were also tried out. The graphic curve compared with that of the carotid pulse, but the upward and downward swings were more gradual, as would be consistent with the appearance of an eyeball pulse, as it depends on overcoming the intraocular tension first.

Beulah Cushman.

14. EYELIDS AND LACRIMAL APPARATUS

Arruga. **Modification of the trephine for perforating the bone** in **Toti's operation.** Klin. M. f. Augenh., 1929, v. 82, Feb., p. 239. (1 ill.)

The instrument is described and illustrated. *C. Zimmermann.*

Axenfeld, T. **Remarks on the secondary effects of extirpation of the palpebral lacrimal gland.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 243-247.

According to Axenfeld, extirpation of the palpebral lacrimal gland for diminution of uncontrollable and distressing lacrimation, under the necessary precautions, remains a legitimate and useful operation subject to the following conditions: It is contraindicated in cicatricial affections of the conjunctiva, especially in trachoma. As pointed out by Engelking, it must be shown before every operation that at least normal moisture exists, by means of Schirmer's blotting paper method. It is not advisable to remove tear sac and lacrimal gland in one sitting. Referring to the article by Knapp (Klin. M. f. Augenh., same issue), the corneal lesion in his case may have been caused during operation. Axenfeld always covers the cornea with a layer of boric acid salve for protection. *C. Zimmermann.*

Cavka, V., and Prica, M. **The action of lysozyme in normal and pathologic eye secretions.** Graefe's Arch., 1929, v. 121, p. 740.

Flemming in 1922 designated as lysozyme that substance in the tissue and secretions of the organism having lytic properties against certain bacteria.

The present experiments aimed to show whether pathological processes of the eyes exercised any influence and in what way upon the presence of lysozyme in the tears. For this purpose the tears were obtained in a sterile capillary pipette and diluted with one per cent sodium chloride to a 1 to 100 strength. The organism used susceptible to the lysozyme was a gram-positive yellow-growing sarcina isolated from the air of the laboratory.

The age of the subject had no influence upon the presence of the lysozyme. In the acute conjunctival inflammations there was an essential diminution of the lysozyme content. Chronic inflammatory processes exerted no apparent influence upon the action of the lysozyme. The lysozyme

is not influenced by blood-serum. The aqueous humor and lens in a strength of 1 to 100 showed no lytic properties against the sarcina investigated. It was noted that whereas the lysozyme exerted an influence upon the organism used, there developed no antibacterial effect upon the staphylococcus obtained from the inflamed eyes tested. Zinc sulphate in 0.5 per cent strength exerted no injurious action upon the lysozyme. *H. D. Lamb.*

Frieberg, T. **Some physiological problems concerning the human tear ducts.** Zeit. f. Augenh., 1929, v. 67, Jan., p. 1.

After a reconsideration of his own earlier work on this subject and discussion of papers that have been published since, the author concludes that with open lids there is a negative pressure which produces slow aspiration of tears from the lacus lacrimalis. In the absence of tears surface capillarity prevents the aspiration of air. On closing the lids the lumens of the canaliculi become compressed and the contents are forced into the nose with considerable force, because the upper end of the system becomes closed.

F. H. Haessler.

Knapp. Paul. **The question of detrimental secondary effect of extirpation of the lacrimal gland.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 241-243.

In two cases after extirpation of the lacrimal gland Knapp observed severe catarrh with tough mucous secretion and epithelial defects of the cornea, with obstinate keratitis filiformis. This occurred two years after the operation in the second patient, who suffered from arthritis. In no case was trachoma present. Further investigations are necessary to reveal the conditions under which such complications may arise.

C. Zimmermann.

Kofler, Carl. **Anatomy and variations in bony structure of tear sac region.** Zeit. f. Augenh., 1929, v. 67, Feb., p. 151.

These are described by the author from the large collection of skulls in the museum of anatomy in Vienna. Adequate illustrations accompany this interesting and practically useful article, which must be read in the original.

F. H. Haessler.

Meyer-Waldeck, F. **Treatment of spastic entropion.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 357-358.

The author had very good results from the application of collodion for a width of three millimeters on the lower lid along and below its margin. This may be repeated several times.

C. Zimmermann.

Peters, A. **Epiphora from changes of the epithelium of the caruncle and its neighborhood.** Klin. M. f. Augenh., 1928, v. 81, Dec., pp. 839-841. (2 ill.)

Within four years Peters observed twenty-six cases of epiphora, mostly in the male at the age of puberty, without inflammation of the lids or of the conjunctiva. The dry appearance of the caruncle and of the lid border was striking, due to keratization of squamous epithelium and absence of the normal mucous cells. The lacrimal puncta may become obliterated. In some cases slitting of the canaliculus helped, in others probing, while fasting was resorted to in a few cases.

C. Zimmermann.

Peters, A. **Malformation at the inner canthus.** Klin. M. f. Augenh., 1929, v. 82, Jan., p. 54. (1 ill.)

At the inner angle a small tumor occupied the upper lid of each eye, starting from the region of the upper canaliculus, and encroaching somewhat, especially on the left side, upon the caruncle. It was of light color on the right side, and red on the left from intense formation of blood vessels. It suddenly tapered into a conjunctival fold, which corresponded to the plica semilunaris. Unquestionably it was a

congenital malformation, without a parallel in the literature.

C. Zimmermann.

Pillat, Arnold. **Marked epiblepharon with retroflexion of the eyelashes of both upper lids in a Mongolian.** Arch. of Ophth., 1929, v. 1, March, pp. 315-323.

A remarkable case of this peculiar condition is reported in a Chinese woman of twenty-two years. There was a thin, whitish-yellow line on the skin of each lower lid about six mm. from the margin. The normal folds of the lid were absent. Due to tension along this line, the cilia of both lower lids turned up and in against the cornea. On looking downward, a fold of skin, so-called epiblepharon, covered the margin of the lid and the cilia, narrowed the width of the palpebral fissure, and caused the lashes to turn more strongly against the cornea. There was no ulceration of the cornea and no discomfort, although sensation was normal in all other portions of the cornea. The author is of the opinion that one of the most characteristic signs of the Mongolian lid fold beside the epicanthus is a more or less developed epiblepharon.

M. H. Post.

Shimkin, N. **Three cases of spastic entropion after total tarsectomy of the upper lid, cured by implantation of tarsus.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 360-364. (4 ill.)

The conjunctiva along the whole lid border was incised and dissected as far as necessary for insertion of tarsus taken from another person in whom tarsectomy had been performed. The sutures were removed on the sixth day. Blepharospasm and entropion subsided entirely.

C. Zimmermann.

Terson, A. **Treatment of spontaneous entropion.** Ann. d'Ocul., 1929, Feb., v. 166, pp. 89-101.

In cases of this kind, which usually occur in old people, the author has found subcutaneous injection of one cubic centimeter of alcohol at eighty degrees centigrade, either alone or with iodin, to be efficacious in curing the condition. He discusses the pathology of this type of entropion and ectropion. Where operation is permitted he believes in the excision of a longitudinal strip of skin and subcutaneous tissue with sutures deep into the firm connective tissue at the base.

Lawrence Post.

Tokareva. **Dislocation of the lacrimal glands.** Russkii Opht. Jour., 1929, March, pp. 373-376.

To the forty-three cases of lacrimal gland dislocation reported in the ophthalmic literature, the author adds his own observation. A woman thirty-eight years old had noticed a year ago a growing "tumor" in the outer part of the upper eyelid. On examination a soft, lobular, and movable mass, the size of a kidney-bean, was found in the temporal part of the left upper eyelid. Because of the typical location, consistency, and relation to the surrounding tissues, the diagnosis of a displaced lacrimal gland was made. The gland was removed through an incision in the outer upper part of the orbital rim. On pathologic examination a chronic interstitial dacryoadenitis was found.

M. Beigelman.

Valière-Vialex. **Treatment of spastic entropion.** Ann. d'Ocul., 1929, Feb., v. 166, pp. 102-105.

Removal of the entire marginal portion of the orbicularis muscle of the affected lid is advocated as an excellent method of dealing with this disease where it is associated with a conjunctivitis and amounts to more than the simple cases caused by bandages and so on.

Lawrence Post.

Wiedersheim, O. **Atrophy of, and cyst formation in, the lacrimal gland after occlusion or removal of its ducts.** Klin. M. f. Augenh., 1928, v. 81, Dec., pp. 754-763. (8 ill.)

Wiedersheim shows on four cases, with clinical histories and anatomical

changes, that operative occlusion of the ducts of the human lacrimal gland leads to its atrophy. The pathological process is this: After stasis occurs, as soon as the secretory pressure of the glandular cell equals the pressure of the stasis the retained fluid will be absorbed by the walls of the ducts. The glandular cells are gradually compressed and damaged. On the other hand they can secrete only very little in consequence of the pressure stasis, and so are destroyed by inactivity and pressure, perhaps aided by the detrimental action of the decomposed secretion. The lumina become ectatic, and this is followed by shrinking and disappearance of the special glandular cells, with increase of connective tissue. Finally the whole lobule shrinks.

One case of retention cyst with atrophic changes after shrinkage of the conjunctiva from pemphigus is described, and one after dislocation of the lacrimal gland. While acute occlusion of the ducts leads to atrophy, slowly developing occlusion seems to be important for the genesis of cyst formation, by alternating stasis and temporary flow. *C. Zimmermann.*

15. TUMORS

Alexeeva, V. K. **On the differential diagnosis of glioma and tuberculosis of the eye.** Archiv Oftalmologii (Russian), 1929, v. 5, pt. 3, pp. 332-337.

After a review of literature on the diagnostic mistakes in differentiating between intraocular glioma and tuberculosis of the eye the author reports the following case. In a child three years old, grayish-white nodules in the iris with hypopion and vitreous opacities suggested a tuberculous uveitis, but in a few months the appearance of tumor masses in the anterior chamber and a general distension of the eyeball indicated the presence of an intraocular glioma. The latter diagnosis was confirmed by pathologic findings. *M. Beigelman.*

Barletta, Vincenzo. **Hypertension of the eyeball in differential diagnosis between glioma and pseudoglioma.** Ann. di Ottal., 1929, v. 57, Jan., p. 70.

The conditions with which glioma may be confused are plastic choroiditis, metastatic choroiditis, organized fibrosis of the vitreous, tuberculoma of the choroid, gumma, detachment of the retina, sarcoma of the choroid in its first stage, intraocular cysticercus, and certain congenital defects such as persistent hyaloid artery. Coats's retinitis is also sometimes found in children as young as those in whom glioma appears. Lagrange has laid down the rule that when glioma is present the eye is glaucomatous or tends to glaucoma, while in pseudoglioma the eye is hypotonic or tends to phthisis. There are exceptions, of which the author describes a case. In the earlier stages of this case there was lowered tension, which increased only when the disease had progressed so far that enucleation was too late. *Park Lewis.*

Den Hoed, D., Stoel, G., and De Vries, S. **Investigations on appropriate eye protection in radiation of the eyelids.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 158-162. (1 ill. and 3 curves.) (See Section 2, Therapeutics and operations.)

De Vries, S. **Radiation treatment of cancer of the eyelids.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 146-158. (2 ill.)

See editorial p. 512 of this Journal, June, 1929.

Kaganowa. **Rare iris lesions; includes case of sarcoma.** Zeit. f. Augenh., 1929, v. 67, Jan., p. 61. (See Section 7, Uveal tract, sympathetic disease, and aqueous tumor.)

Koliopoulos. **Anatomic researches on the cause of hypertension in choroidal tumors.** Ann. d'Ocul., 1929, v. 166, March, pp. 206-218.

The conclusion from this study is that the cause of the hypertension was not explained by the extent of the tumor, the amount of the intraretinal fluid, or other known anatomical con-

sideration. The only even suggestive fact was that when the tumor was located in the anterior segment the hypertension usually occurred earlier than when the situation was more posterior. *Lawrence Post.*

Seefelder, R. **Is enucleation or exenteration of the orbit advisable in sarcoma of the choroid?** Klin. M. f. Augenh., 1929, v. 82, March, pp. 289-294. (3 ill.)

Referring to a recent article by Wätzold, who examined microscopically twenty-seven eyes with sarcoma of the choroid and found in twenty a penetration of the tumor into the blood and lymph channels of it and its immediate surroundings, and who therefore recommended exenteration of the orbit in all cases of sarcoma of the choroid, Seefelder examined thirteen cases of his own with regard to this question. Out of nine eyes cut in uninterrupted series, in one the sarcoma was confined to the choroid, while in five an invasion and in three a penetration of the sclera along the perforating vessels had occurred. In none was metastasis found, although the longest period of observation was nine years after enucleation. As the danger for life is not essentially diminished by exenteration, and that of local relapse is not great, enucleation of the eyeball with a large piece of the optic nerve and the adherent orbital tissue seems to be sufficient. If penetration of the tumor through the sclera is found, then with the consent of the patient exenteration of the orbit ought to be done immediately.

C. Zimmermann.

Shoji, Y. **A case of primary epithelioma of the meibomian gland invading the orbit, with atrophy of the globe.** Arch. d'Opht., 1929, March, v. 46, p. 144.

A review of the literature of Japan presenting nine cases of epithelioma of the meibomian glands is given. The particular case observed by the writer occurred in a man sixty-nine years old and appeared five years ago as a small nodule resembling a chalazion, on the right lower lid. It slowly grew to the size of the fist, with an ulcerated area in the region of the lower lid. The orbit was invaded and the globe compressed but not ruptured. The enucleated tumor weighed 48 gm. Microscopic examination showed its origin from the meibomian glands, with two types of cells. The first have a large nucleus and small amount of protoplasm, and the second have a small nucleus and a large reticular cytoplasm filled with fat, that is the sebaceous cells of the meibomian glands. The review showed these tumors to affect persons between thirty-five and sixty-nine years of age, more commonly males. The tumors are slow-growing, usually taking from three to five years to invade the orbit, but they are very malignant with regard both to recurrence and to invasion of the orbit. In the writer's case the globe was destroyed by atrophy but the tumor cells had not passed through the cornea or sclera.

M. F. Weymann.

Soloviev, L. K. **On the diagnosis of orbital tumors.** Archiv Oftalmologii (Russian), 1929, v. 5. pt. 3, pp. 317-322.

The following two instances of difficult orbital diagnosis are reported: In a case of extreme and rapidly progressing unilateral exophthalmos with blindness due to a postneuritic optic nerve atrophy, orbital malignancy was diagnosed and exenteration of the orbit was resorted to, but pathologically a retrobulbar cavernous hemangioma was found. In the other case the presence of a new growth in the upper outer corner of the orbit with displacement of the eyeball inward and downward suggested a tumor of the lacrimal gland, but microscopically a cavernous hemangioma was again diagnosed. *M. Beigelman.*

Wiegmann, E. **A case of psammoma of the orbit.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 232-236.

For two years a girl aged sixteen years had noticed gradual exophthalmus of her right eye. It was caused by a tumor at the upper nasal angle of the orbit, too hard for a cyst or mucocele and not hard enough for an osteoma. The frontal margin of the orbit was removed with the chisel, and a rather soft rust-brown friable mass was exposed whose wall was firmly adherent to the mucous membrane of the frontal sinus. As parts of the posterior wall of the frontal sinus were lacking, probably from erosion, complete detachment of the tumor was abstained from on account of possible opening of the dural sac. For drainage an opening toward the nose was made in the ethmoid. Uneventful recovery followed. Vision was 5/5, and there were no ophthalmoscopic changes. The microscopic examination revealed psammomatous fibroendothelioma. After two years the patient returned with displacement of the eyeball downward and to the temporal side, due not to a relapse but to an abscess starting from the ethmoid. This was cured by evacuation of the pus and drainage. Most likely the tumor originated in the dura mater, and a relapse is not excluded. *C. Zimmermann.*

16. INJURIES

Kanda, K. **Anterior capsular cataract and annular endothelial opacity of the cornea, in an electric welding operator.** Jour. Med. Assoc. of Formosa, 1928, no. 274, Jan. 28. Reprint in Japanese; summary in English.

The conditions outlined in the title and described in the paper developed after several attacks of photophthalmia. (3 illustrations.)

Ralph W. Danielson.

Loddoni, G. **Cataract from copper.** Ann. di Ottal., 1929, v. 57, Jan., p. 28.

The experiments of the author were made on the eyes of living rabbits and on a dog. The lenses also of various animals, including those from the human eye, were allowed to remain in copper sulphate solutions for periods varying from ten days to three months. In the latter cases the lenses assumed a greenish yellow color. In the living animals, as in human eyes in which a fragment of copper had entered, the ophthalmoscopic appearances were markedly distinctive. A cataract was developed affecting the posterior capsule. The opacity was about three millimeters in diameter, with daisy-like rays extending toward the periphery. The central part of the lens was completely transparent and the opacity was invisible by direct illumination. It could be seen only by oblique light. Microscopically no lesion of the lens was found, but beneath the anterior capsule was noted a fine layer of greenish tint. Under high power this was found to lie between the anterior capsule and the epithelial layer. The writer believes that these experiments tend to throw light on the physiology of lens nutrition. *Park Lewis.*

Schöpfer, O. **Traumatic implantation cyst of the ciliary body.** Klin. M. f. Augenh., 1929, v. 82, Jan., pp. 90-93. (1 ill.)

The left eye of a laborer aged forty-five years was struck by a piece of iron, causing a perforation of the cornea and sclera one cm. long, with prolapse of iris and ciliary body, and traumatic cataract. The prolapse was excised. Vision was only perception of light. The wound was covered by a conjunctival flap. On account of continued irritation and sympathetic danger, the eye was enucleated after two months. There were no evidences of growing in of epithelium through the wound. Shreds of epithelium were implanted freely between the ciliary body and sclera, producing an implantation cyst, as histological examination showed.

C. Zimmermann.

Scullica. F. **The behavior of the endothelial reticulum in certain pathological processes experimentally produced.** Ann. di Ottal., 1929, v. 57, Jan., p. 15.

The author carried out a series of experiments on the lower animals, chiefly rabbits, for the purpose of determining the phagocytic and tissue reaction of the reticulo-endothelial system in the presence of injuries and irritants affecting the eyes. The conclusion reached was that in phlogistic conditions of the eye the endothelial reticulum reacted precisely as it did in other structures of the organism.

Park Lewis.

Thies, O. **Very severe burns.** Klin. M. f. Augenh., 1929, v. 82, March, pp. 353-357. (2 ill.)

In one case reported by Thies, the face, hands, and arms were injured by sodium hydroxide escaping from a kettle under high pressure, with total destruction of both eyes; in the other case the injury was by hydrochloric acid containing iron filings.

C. Zimmermann.

17. SYSTEMIC DISEASES, INCLUDING PARASITES

Achermann, E. **On the heredity of Recklinghausen's disease.** Zeit. f. Augenh., 1929, v. 67, Feb., p. 141.

The author describes the manifestations of this disease occurring in a father and son and one daughter. The son had a normal child, and the three children of the father's two normal children were normal. The inheritance in the first filial generation in this case suggests that the disease is a dominant characteristic. The entire absence of the disease in the third generation does not completely contradict the belief in dominant inheritance of the disease, because of the small number of children in the family reported. No large family trees of families afflicted with this disease have been reported. The author points out that this is easily explained in that Recklinghausen's disease so disfigures its victims that marriage is rare.

F. H. Haessler.

Aubaret, E. and Sédan, Jean. **Major and minor ocular anguish.** Clinique Opht., 1928, v. 17, Oct., p. 543.

Aubaret and Sédan describe two clinical syndromes both characterized by visual disturbance and a profound mental reaction of intense fear of blindness, comparable in symptoms and etiology to cardiac anguish or angina pectoris. The first or major syndrome is seen rather frequently in subjects with overactive sympathetic nervous systems or with endocrine disturbances and occasionally in the intoxications due to lead, sodium salicylate, quinine, tobacco or alcohol. The principal symptoms are, first a more or less intense fogging of vision, rarely total, which comes on rapidly, lasting from a few seconds to an hour or more, and second an extreme fear of blindness. There may also be a sensation of weight in and behind the eyes, mild frontal or orbital headaches, and occasionally mydriasis persisting after return of normal vision. The disturbance is usually unilateral and can be distinguished from other types of vascular spasm such as the classic ophthalmic migraine or cortical angiospasms, which usually produce a hemianopic form of visual disturbance. The second or minor syndrome comprises a group of phenomena of similar type occurring in the course of intercurrent ocular disease, such as glaucoma, chorioretinitis, neuroretinitis, retrobulbar neuritis, and retinal arteriosclerosis, and having similar though usually less intense symptoms. The frequency of appearance of the syndrome apparently corresponds to the progress of the disease and may be used as a guide in therapy. For symptomatic treatment, vasodilators are indicated, amyl nitrite being preferred because of its rapid action.

Phillips Thygeson.

Bistis, J. **Ocular complications of dengue.** Zeit. f. Augenh., 1929, v. 67, Feb., p. 158.

Swelling of the lids, blepharitis, pain in the eye muscles, metastatic ophthalmia, punctate keratitis, dendritic keratitis, iritis, glaucoma, and retrobulbar neuritis have been men-

tioned. The author has observed in most cases a conjunctivitis with little exudate, developing on the third or fourth day of the disease. Corneal ulcers never occurred and the conjunctival disturbance healed in a short time. In one case paralysis of an extraocular muscle occurred and recovered in one month. Paresis of accommodation occurred in several cases. There was one case of retrobulbar neuritis, and two of optic neuritis. In one patient two attacks of blindness of twenty minutes duration occurred, and were interpreted as scotoma scintillans. One case of multiple chalazion seemed reasonably attributable to dengue.

F. H. Haessler.

Gabriélidès, A. **Dengue fever and its ocular complications.** Ann. d'Ocul., 1929, v. 166, March, pp. 183-199.

Brief history and description of the disease are given. Ocular complications are divided into those occurring during the course of the disease and those occurring during convalescence. Among the former are conjunctival hyperemias and conjunctivitides, lid and muscle pains, and blepharitis. Among the latter are diplopia, entoptic phenomena, keratitis, iritis, and metastatic ophthalmia. About a dozen cases are cited.

Lawrence Post.

Grønholm, V. **Ocular tuberculosis and constitution.** Acta Ophth., 1929, v. 6, no. 4, pp. 297-310.

Grønholm found one case of ocular tuberculosis in each 300 eye cases at Helsingfors and studied 100 patients so affected to determine what constitutional factors were present. Sixty-six per cent of the cases occurred between the ages of fifteen and thirty years, the mean age of incidence being twenty-three years. The sexes were equally affected in respect to age of onset. Ocular tuberculosis, therefore, is a "late" manifestation of the disease, appearing after phlyctenular disease, meningitis, and military tuberculosis. The female is affected three times as often as the male, this being true in all types of tuberculosis. Ocular tuberculosis, as is well known, is rarely found in sanatoria for pulmonary disease.

Affected children below fifteen years of age were usually small and weak, some emaciated with phthisical habitus, and the same was true of the men patients. Of the seventy-five women in the group, however, only eight were undersized and the ocular disease was found in a striking number of cases in robust women of the rustic type. Grønholm concludes that ocular tuberculosis attacks, by preference, apparently healthy, vigorously built, and well nourished individuals with an abated, healed or fairly benign tuberculosis in some other organ, most frequently the lymphatic system, rarely the lungs.

E. M. Blake.

Kennedy, Foster. **Ocular disturbances in epidemic encephalitis.** Arch. of Ophth., 1929, v. 1, March, pp. 346-350.

The author states that in such a disease as epidemic encephalitis the variety of symptoms must inevitably be extreme. A wide-spread neurotropic infection must produce a great many different disease pictures. Disturbances of motor function arising from damage to ganglionic mechanism are common. Blepharospasms, ptosis, weakness or paralysis of both external recti, and transient diplopia all fall under this general heading. Ptosis is probably due to a direct attack on the third nerve or its nucleus, while paralysis of divergence is probably rather the result of spasm of the recti. Rhythmic movements, monolateral or bilateral, may occur among the extraocular muscles. Palsies of the ocular muscles also may be present. Diminution of loss of conjugate associated movements of the eyeball in the vertical meridian may occur, as may also those in the horizontal meridian, though less frequently. These disturbances are more common in the acute stages of the disease, but

may be slowly progressive in the chronic cases. Argyll Robertson pupils are not uncommon, due to "subependymal periaqueductal changes". Occasionally paresis of accommodation occurs. Nystagmus is almost the rule, both the cerebellar and labyrinthine. This occurs both vertically and laterally and is accompanied by dizziness. Retrobulbar neuritis is rare; papilledema is uncommon. The onset in all cases observed was sudden, with slight headache; a period of stupor was followed by one of excitement or disorientation.

M. H. Post.

Larsson, S. **Diathermy of ocular leprosy.** Acta Ophth., 1929, v. 6, no. 4, pp. 344-349.

Larsson employed diathermy in ocular leprosy, using a small active electrode on the tumor mass and a large indifferent electrode on the back. The destroyed, sloughing mass is carefully scraped away and the process repeated until improvement occurs. A marked injection of the globe follows the endothermy but a fairly soft, pliable scar results. Two cases were successfully treated in this way. In one, the globe was covered with large lepromata and an iridocyclitis was present, requiring enucleation of one eye. The second case was less severe, with episcleral leprous infiltrations at the limbus. In each case the ocular process came to a standstill and vision was improved. The author feels that in some unknown manner diathermy establishes a certain power of resistance of the tissue against renewed manifestations of the leprous process. Scar tissue is known to be relatively resistant to the leprosy bacillus. *E. M. Blake.*

Otchapovski, S. V. **Leprosy and the eye.** Archiv Oftalmologii (Russian), 1929, v. 5, pt. 3, pp. 267-288.

Of the 241 patients in the leprosariums of northern Caucasus, 64.1 per cent presented signs of ocular involvement. These eye complications were observed more often in men than in women; more in tuberculous leprosy than in the anesthetic form; more in old age than in young persons. The eyelids with the conjunctiva, the corneosclera, and the iris with the ciliary body shared equally in the frequency of leprous involvement, while the posterior portion of the eyeball, the choroid, retina, and optic nerve, was practically never affected. The conjunctival lesions were in the form of a solid infiltration without any tendency to disintegration, and they were mostly located at the ciliary border of the tarsus and at the corneoscleral junction, probably because of a slower lymph circulation in these parts of the conjunctiva. The absence of ulceration, characteristic of conjunctival lepromata, is also evidenced in leprous involvement of the cornea. There is usually a slow but progressive sclerosis of the corneal parenchyma, with resulting impairment of visual acuity and even complete blindness. The iritis, when due to leprosy, is of a parenchymatous type with or without the formation of nodules. In the course of this iritis prolonged periods of inactivity are succeeded by occasional exacerbations. As to the pathogenesis of leprous iritis, the author stresses a direct continuation of the diseased process from the corneosclera upon the iris and ciliary body, rather than an endogenous origin on the basis of bacillary metastasis.

As a whole the course of eye complications in leprosy presents the seemingly inactive, though progressive and in the end destructive, character which is the general clinical feature of leprosy. *M. Beigelman.*

Rossi, V. **Pathology of individuality in ophthalmology (Endocrine factors of individuality in ophthalmology).** Arch. di Ottal., 1928, v. 35, June, p. 262. See also this Journal, 1928, Nov., p. 941.

This article contains interesting data in general, but little with relation to the influence of endocrine function on the eye, from the clinical point of view. It contains, however, much information on endocrine activity in re-

lation to the histopathology of the eye. *D. Alperin.*

Rossi, V. **Neurovegetative factors and the pathology of individuality in ophthalmology.** Arch. di Ottal., 1928, v. 35, June, p. 251. See also Amer. Jour. Ophth., 1928, Nov., p. 941.

The article treats of the anatomophysiological relationships of the eye and the sympathetic and parasympathetic systems; the latter a protective mechanism controlling the sphincter iridis, ciliary muscle, and lacrimal gland; the former a disintegrating mechanism controlling the dilator pupillæ and the muscle of Müller. He shows the analogy between the cardiac and the pupillary innervation; the autonomic system, homologous to the vagus, moderating the cardiac activity and, by prolonging the diastole, contributing to increased tone of the myocardium, while the sympathetic is the accelerating and catabolic governor of the myocardium. The article contains an interesting description of the phylogenetic and ontogenetic development of the eye, as well as a clear explanation of vagotonic and sympatheticotonic morbidity.
D. Alperin.

Saeger, F. **Stimulation of vascular proliferation in the cornea with galvanocautery and remarks on filaria of the eye.** Klin. M. f. Augenh., 1929, v. 82, Feb., pp. 223-229. (1 ill.) (See Section 6, Cornea and Sclera.)

Sergeeva, E. N. **Eye changes in leukemia.** Russkii Opht. Jour., 1929, March, pp. 334-342.

The ophthalmoscopic and pathologic changes in the eyes of five leukemic patients are reported. Only in one case, of mixed chronic lymphocytic and acute myelogenic leukemia, were these findings negative. In the rest—three cases of lymphocytic and one of myelogenic leukemia—the ophthalmoscopic examination revealed distension of the retinal veins, hemorrhagic and white exudative spots in the retina, edema of the optic disc and of the retina, and general yellowish discoloration of the fundus. Pathologically, in addition to retinal changes which correspond to the ophthalmoscopic findings, a diffuse lymphoid infiltration of the choroid without any dilatation of blood vessels and with some occasional hemorrhages was found.
M. Beigelman.

Velter, E. **Introduction to the study of ocular neurology.** Arch. d'Opht., 1929, March, v. 46, p. 136.

The relationship between ophthalmology, otology and neurology is discussed. The eye is described as being part of the central nervous system, as proved by its embryological development. The motor, sensory, and sympathetic innervation is described and mention is made of the various neurological lesions and syndromes in which the eye is involved. The article is evidently written merely to stimulate interest in neurological ophthalmology and contains no new material. *M. F. Weymann.*

Vogt, A. **The aging of the eye.** Schweiz. med. Woch., 1929, v. 59, no. 11, p. 301.

The span of life is a function of the germ plasm and is determined by heredity. Different organs have their especially inherited longevity. Thus the death of the melanoblasts leading to greying is first to take place. In the eye tissues abiotrophy is exhibited in arcus senilis, senile cataract, senile macular degeneration, senile central and peripheral choroiditis, senile circumpapillary atrophy, drusen of the vitreous lamella, vitreous opacities, scleral rigidity, and the familiar senile sclerosis of the lens nucleus, all of which are not diseases but instances of individual tissue longevity transmitted by heredity. Not only is cataract a hereditary characteristic but its different forms are determined by heredity. Vogt warns against the danger of drawing conclusions from visual acuity as to the effects of various

therapeutic measures on the progress of cataract. *M. Davidson.*

Werdenberg, E. **The modern approach to the problem of ocular tuberculosis.** Schweiz. med. Woch., 1929, v. 59, no. 6, p. 126.

On the basis of his Davos material of 320 tuberculous eyes (exclusive of 180 relapses and of the common conjunctival and corneal phlyctenules) and in the light of recent studies in the field of tuberculosis, the author summarizes his conclusions regarding diagnosis, prognosis and treatment. In accordance with correlated pathological and immunological facts two principal forms are recognized: (1) the benign proliferative, with tendency to cicatrization, nonhypersensitive, corresponding to hematogenous uveal tuberculosis in animal experiments and to Ranke's first and third types; (2) malignant exudative, with tendency to caseation, hypersensitive, corresponding to the virulent anterior chamber inoculation in animal experiments and to Ranke's second or acme type. Mixed forms in which one or the other preponderates are frequent. Specific therapy is indicated in the first form and contraindicated in the second. Where tuberculin is contraindicated radiation, chemotherapy, and operations are also ill borne, and resort must be had to climatotherapy, diet, nonspecific protein and local therapy.

Prognosis is best up to thirty years, and in recent cases seventy-five per cent of the cases were bilateral, mainly involving the uvea, and seventy per cent were severe. The dosage of tuberculin is most important, the beginning dose being 1/100000 mg. and the terminal dose varying between 1/1000 mg. and 50 mg. The intervals are four to eight days depending on clinical and serological reactions. Sähli's subepithelial method of application is preferred. Results in 210 cases with severe initial visual disturbance were 115 complete cures and 95 with vision of one-third to one-tenth. *M. Davidson.*

18. HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Hessburg, R. **Estimation of errors of refraction, especially high myopia, as to fitness for occupation of mining.** Klin. M. f. Augenh., 1928, v. 81, Dec., pp. 794-801.

In general all myopes of eight diopters and more, hypermetropes of six diopters and more, all cases with complications, and cases of bilateral amblyopia ought to be rejected from work in the mines.

C. Zimmermann.

Smith, E. Temple. **The history of spectacles.** Med. Jour. Australia, 1928, v. 2, Nov. 10, pp. 578-587.

There is but little evidence of the use of spectacles (convex spheres) before the end of the thirteenth century. The author believes that Armati or Spina, instead of Roger Bacon, was the discoverer of glasses. Lenses were considered mysterious until some of the laws of optics were propounded by Maurolycus about 1600. Glasses were not generally adopted because (1) the doctors of the day advised against their use; (2) lack of means of rapid transportation prevented frequent and wide contacts among people; (3) the cost was almost prohibitive; (4) most occupations did not require acute vision; (5) printing was done in large type; (6) glasses were ill-shaped; and (7) their use was ridiculed. Concave spheres were first employed about the middle of the sixteenth century, and cylinders about the middle of the nineteenth century. The first scientific work on spectacles was written by Valdez and published in Seville by Diego Perez in 1623. This article is difficult to abstract because there is so much of interest. (14 illustrations.)

Ralph W. Danielson.

United States Public Health Service. **Relation of illumination to ocular efficiency and ocular fatigue.** Pub. Health Bull., no. 181. See Public Health Reports, 1929, v. 44, Feb. 22, p. 404.

Mail clerks in the Chicago post office, when handling a continuous and heavy supply of mail, were able to increase their speed of sorting about eight per cent in going from an illumination of 2.7 to 10.7 foot-candles. The "looking time" with specially prepared cards decreased about eight per cent when the illumination was increased from 2.5 to 10 foot-candles. Ocular fatigue was tested by recognizing the break in a broken circle after 0.011 of a second exposure. This was called "snap acuity" because accommodation and fixation are negligible. Snap acuity was found to be slightly lower at the close of the day's work than at the beginning, but no relation was observed between snap acuity and the degree of illumination under which the subject had been working. Snap acuity improved after prolonged work with high illumination. *Ralph W. Danielson.*

Vogt. A. **Eye injuries and compensation for disability.** Schweiz. med. Woch., 1929, v. 59, no. 10, p. 277.

Vogt argues against the agitation of "Suva" (Swiss Compensation Insurance Society—apparently state controlled) for a revision of the compensation of 25 to 33 per cent allowed in Switzerland for the loss of an eye. On the basis of its statistical studies of the actual loss of earning capacity of its one-eyed beneficiaries, "Suva" proposes compensation of a little above ten per cent, and in view of the added risk of total blindness which in their opinion originally motivated the high compensation, proposes in lieu of the difference the guarantee of a supplementary compensation to bring up the compensation to that of permanent total disability in case of subsequent loss of the other eye through injury up to the age of seventy years. Vogt argues that the loss of visual field and stereopsis sustained in the loss of one eye must be considered, that the studies of Grolmann and others have shown that a one-eyed person acquires only limited depth perception by means of parallax and shadow and overlapping, that the risk of loss of the other eye is negligible, but that the senile and pathological weakening of the remaining eye is a constant phenomenon and handicaps the one-eyed person to a greater degree, and that the allowance of 25 to 33 per cent has been almost universally agreed upon after careful studies for many years. Incidentally he protests against the regulation limiting liability for total permanent disability in case of sympathetic ophthalmia to nine years as insufficient. *M. Davidson.*

Weve, H. **How old are lenticular lenses?** Janus, 1928, v. 32, July, pp. 227-230.

Patented in England and France about 1870, they were popularized by German opticians toward the beginning of the twentieth century. There is, however, a portrait of the Dutchman Jacob Van Haefton by the engraver C. Vermeulen, dating from the year 1739, which is itself a copy of De Crager's portrait of about 1639, which shows that they were already in use in the seventeenth century. Incidentally the author finds that concave lenses were in use in Holland about 1480. *M. Davidson.*

NEWS ITEMS

News items in this issue were received from Drs. C. A. Clapp, Baltimore; C. P. Loranz, Birmingham; M. Paul Motto, Cleveland; J. M. Patton, Omaha; G. Oram Ring, Philadelphia; Raymond Sisson, Detroit; A. G. Wilde, Jackson, Mississippi; and H. V. Würdemann, Seattle. News items should reach **Dr. Melville Black,** Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. Charles Deady, New York, aged seventy-eight years, died in May of heart disease.

Dr. Albert Barlow Hale, Rio Piedras, Porto Rico, aged sixty-eight years, died April 13 of heart disease.

Finland, which had only thirty ophthalmic physicians, has recently lost three of them within a short time, Osmo Neovius, Ernst von Knape, and K. R. Wahlfors, professor emeritus in Helsingsfors, who was eighty years old, and who was spoken of as the Nestor of northern ophthalmology.

Rémy Jocqs, of Paris, France, died in April, 1929. With Darier the elder, he founded the French eye journal "Clinique Ophtalmologique".

Jules Badal, one of the deans of ophthalmology in France, died recently. He was born in 1840, and was awarded the cross of the Legion of Honor for his conduct during the siege of Paris after the war of 1870. He was for many years in charge of the ophthalmic clinic of the faculty of medicine of Bordeaux. He was the inventor of a number of instruments and apparatus for use in clinical work, including an ophthalmometer and an optometer.

On March 19, 1929, in Rome, died at the age of sixty-five years Professor Cirincione, for many years head of the university eye clinic at the Roman "policlinico". He was a pupil of His (Leipzig) and also worked under Schweigger. In 1900 he established the Italian eye journal "Clinica Oculistica", which in 1918 was combined with the "Annali di Ottalmologia". The combined Annali di Ottalmologia e Clinica Oculistica was printed in the basement of the Policlinico, where the complete printing plant, under Cirincione's personal supervision, included equipment for the making of the color plates, of excellent quality, which have been so numerous in that journal. In 1924, Cirincione played an important part in establishing the "Società Italiana d'Ottalmologia" (Italian Ophthalmological Society).

Miscellaneous

Candidates whose applications are still pending before the American Board of Ophthalmic Examinations and the American Board of Otolaryngology should not forget that, after the Portland meeting of the American Medical Association, the next examination in ophthalmology and otolaryngology will be held on Monday, October 21, in Philadelphia, in relation with the thirty-fourth annual meeting of the American Academy of Ophthalmology and Otolaryngology, which will take place in Atlantic City, New Jersey, October 21 to 25, 1929. New applicants should communicate with either Dr. William H. Wilder, secretary of the American Board for Ophthalmic Examinations, at 122 South Michigan Avenue, Chicago; or with Dr. W. P. Wherry, secretary of the American Board of Otolaryngology, at 1500 Medical Arts building, Omaha.

One of the foremost charitable activities of the Lions' Club of Denver is displayed toward Colorado's blind. Every blind person in the state is given a Braille magazine if he wishes it, and the Lions have contributed to the Braille library at the state home for the blind in Colorado Springs.

The United States government maintains public health service in the form of trachoma hospitals in Kentucky, Tennessee, and Missouri, the states cooperating in the conduct of the institutions. Missouri and Arkansas probably have as much trachoma now as Kentucky had in the beginning. The United States public health service says that trachoma exists to a dangerous extent in other states. Missouri has a "blind pension law", and in one year pensioners cost the state $200,000, and twenty per cent of these people were blind because of trachoma.

The California State Board of Medical Examiners reports that one William McBride pleaded guilty, March 7, to practicing without a license and was sentenced by Judge Finney at El Centro to serve six months in jail. McBride was arrested for performing a fake "radium operation" to remove a cataract from the eye of James Cook, an aged man living near Westmoreland in Imperial county. He was accompanied by Roy E. Francis, who had a membership card of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada. The part Francis played was to tell the victim that McBride was a great eye specialist. McBride, at the time the offense was committed, was on parole from a penitentiary sentence in Oregon. He practiced similar fake operations there and was eventually indicted and convicted for larceny. His method in Oregon was to locate some aged person who had trouble with his eyes and who had money. An assistant would call on the prospect, advising him

to go to a distant city for radium treatment to save his sight. The victim objected, naturally, and he was then told of the great eye specialist, McBride. McBride would put something in the victim's eye which would coagulate, then pull it out with tweezers, show it to the victim, collect a fee at once and leave. It is reported that McBride's wife made restitution to all persons in Tillamook county, Oregon, from whom her husband thus obtained funds, and that she paid the costs of his prosecution. It was under those circumstances that his Oregon sentence was postponed and McBride was permitted to go to California. (Journal of the American Medical Association.)

Personals

An announcement has been received of the removal of the offices of Dr. Raymond Sisson to the David Whitney building, Detroit.

Dr. Sanford R. Gifford has been appointed professor of ophthalmology at the Northwestern University medical school in Chicago. He will take up his new duties on January 1, 1929.

The New York university conferred the degree of Sc. D. upon Dr. W. H. Wilmer on May 12.

Dr. E. C. Foote of Hastings, Nebraska, has returned after several months in India and some European countries. He reports very interesting clinical experiences.

At a recent dinner given by the International Medical Club of New York, Dr. S. Ochi, professor of ophthalmology at Hokkaido Imperial university of Japan, was a guest.

Dr. and Mrs. Maxwell Langdon, of Philadelphia, will sail for Europe early in August. Dr. Langdon will attend the ophthalmological congress at Amsterdam.

Dr. Harry Friedenwald has resigned the chair of Ophthalmology and Otology at the university of Maryland. The doctor is away visiting Italy and Palestine, and will return in August.

Dr. C. E. G. Shannon, professor of ophthalmology at Jefferson medical college of Philadelphia, will sail for Europe with Mrs. Shannon late in July, and will attend the international congress of ophthalmology.

Dr. G. Oram Ring of Philadelphia returned late in May from a brief but exciting tarpon fishing trip on the west coast of Florida. Dr. and Mrs. Ring will sail for Europe late in July and will attend the congress at Amsterdam.

Dr. William Zentmayer, of Philadelphia, has recovered from a recent illness. Dr. Zentmayer's friends have also learned with regret of the death of his only brother.

Dr. Howard Forde Hansell, emeritus professor of ophthalmology of Jefferson medical college of Philadelphia, has been wintering on the Italian Riviera. Dr. and Mrs. Hansell are now at Vittel and will return to America in August.

Dr. A. D. Ruedemann, ophthalmologist to the Cleveland Clinic, escaped unharmed from the unfortunate catastrophe which recently came to that institution.

On May 13 the Milwaukee Oto-ophthalmic Society gave a dinner in honor of Dr. Harry V. Würdemann of Seattle. Dr. Würdemann gave an address on the subject of physical examinations of aviation pilots. Two days later Dr. Würdemann was a guest of the Ophthalmological Club of Detroit, to whom he spoke on the medical aspects of aviation.

Dr. J. L. E. Keyes of Youngstown, Ohio, is leaving in July to attend the international ophthalmological congress at Amsterdam, after a visit to the ophthalmic hospitals of London and Edinburgh.

Major A. G. Wilde, Medical Corps, has resigned from the army after eighteen years service. During this time he has served as chief of ophthalmology at the Walter Reed general hospital, Washington, D.C., and the base hospital at Fort Sam Houston, San Antonio, Texas, as well as filling various professional assignments in France, Austria, the Philippine Islands, and China. Dr. Wilde will henceforth be in private practice at Jackson, Mississippi, where he will devote himself to ophthalmology and plastic surgery of the face.

Joseph Imre, Jr., professor of ophthalmology in the university of Pecs, Hungary, and director of the government ophthalmic hospital in the same city, was recently appointed to the directorship of the government ophthalmic hospital at Budapest, an institution having a bed capacity of one-hundred and seventy-five. It will be remembered that in 1926 Professor Imre gave a series of lectures and several courses on operative surgery of the eye, including plastics, throughout the United States.

Dr. M. E. Marcove, recently interne of Wills' eye hospital, Philadelphia, has opened an office in the Republic building, Denver. He is associated with the University of Colorado eye clinic. Dr. Marcove will take charge of Dr. Melville Black's practice during the latter's absence while attending the international congress of ophthalmology at Amsterdam.

In the April, 1929, issue of the Annales d'Oculistique is published in French a paper by Dr. Daniel B. Kirby of New York, giving a complete statement of his experiments in the cultivation of lens epithelium in vitro. (See also Archives of Ophthalmology for March, 1929.)

Societies

The Indiana Academy of Ophthalmology and Otolaryngology met at Rushville, Indiana, April 25.

On May 27 the Chicago Ophthalmological Society was addressed by Drs. George W. Paul and Roland P. Mackay on ophthal-

moplegic migraine, and by Dr. George F. Suker on idiopathic hypertension and its ophthalmic findings.

At the annual meeting of the Nebraska Academy of Ophthalmology and Otolaryngology in Omaha, May 13, Dr. E. B. Brooks of Lincoln was elected president, Dr. A. E. Gadbois of Norfolk vice-president, and Dr. Clarence Rubendall of Omaha secretary-treasurer.

At the last meeting of the section on eye, ear, nose, and throat of the Southern Medical association the following officers were elected: chairman, Dr. William Thornwall Davis, Washington, D.C.; chairman-elect, Dr. Frederick E. Hasty, Nashville, Tennessee; secretary, Dr. Fletcher D. Woodward, University, Virginia. The next annual meeting of the association will be held in Miami, Florida, November 20 to 22.

The North Dakota Academy of Ophthalmology and Otolaryngology met in annual session June 6, in Fargo, under the presidency of Dr. A. T. Bailey of Jamestown. "Sinusitis in children" was the title of a paper presented by Dr. Kenneth A. Phelps of Minneapolis. Dr. George M. Constans of Bismarck discussed the subject "Blue sclerotics and brittle bone syndrome". Both addresses were illustrated with slides. Dr. Phelps as visiting essayist was elected to honorary membership in the academy. The following officers were elected: president, Dr. George M. Constans, Bismarck; vice-president, Dr. H. B. Beeson, Grand Forks; secretary-treasurer, Dr. F. L. Wicks, Valley City; councillors, Dr. Rolf Tainter of Fargo, and Dr. G. J. Gislason and Dr. M. B. Ruud of Grand Forks.

The American Academy of Ophthalmology and Otolaryngology

Thirty-fourth annual meeting, Atlantic City
October 21-25, 1929

Most of the readers of this JOURNAL will have received the preliminary announcement of the thirty-fourth annual meeting of the American Academy of Ophthalmology and Otolaryngology. However, it may be well to emphasize certain features of this announcement, as issued by Drs. A. J. Bedell and J. J. Shea, publicity committee.

The meeting at Atlantic City is likely to prove the largest in the history of the Academy. The president for 1929 is Dr. Harry P. Mosher, the president-elect Dr. William H. Wilder. The executive secretary is Dr. William P. Wherry of Omaha, the secretary for ophthalmology Dr. William L. Benedict of Rochester, the secretary for otolaryngology Dr. John Myers of Kansas City, the secretary for instruction Dr. Harry Gradle of Chicago. The headquarters of the meeting will be the Hotel Traymore. The Council of the Academy will meet on Sunday the twentieth. Monday the twenty-first will be devoted to golf and registration, except as to those who must either conduct or face the examinations of the boards for ophthalmology and otolaryngology which will be held in Philadelphia. Tuesday will be divided between the joint session, the section for ophthalmology, and special dinners. The instructional hours, under the management of Dr. H. S. Gradle, will occupy the mornings of Wednesday, Thursday, and Friday, the twenty-third, twenty-fourth, and twenty-fifth. The section on ophthalmology will meet again the afternoon of Thursday the twenty-fourth, and the section on otolaryngology will hold its meetings in the afternoons of the twenty-third and the twenty-fifth. There will be the usual banquet at seven p.m. on the twenty-third, and the business meeting at eight p.m. on the twenty-fourth. An innovation will be special lectures on recent advances in otolaryngology and in ophthalmology, in the afternoons of the twenty-fourth and twenty-fifth. A large number of the members of the Academy and from among their families are expected to take part in a trip to the West Indies, on a specially chartered boat of the United Fruit Company; this trip starting in the morning of Saturday, October 26. This year reservations for the instructional conferences must be made by mail, on slips which will be enclosed in the official program.